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MISSIONARY WORK IN SANITATION.

Sanitation is a gospel by itself. It is the Gospel of Health. Like all gospels it has to be preached effectively and must have preachers of the proper caliber.

The great gospels of the past have had their founders, their apostles, their adherents, their temples of worship, their evangelists and their missionaries. They have each played parts of more or less importance in the world's history, because they have all claimed to possess an inside knowledge concerning the life to come. Notwithstanding the fact that history shows that these various knowledges have varied essentially from age to age, each age is satisfied with its own hand-out, and we have little enough friction.

After all, however, the cleanest-cut religions are to be found among nations with the cleanest bodies, the cleanest homes, and the cleanest habits, and the world is waking to the knowledge **that sanitation must become a matter of national compulsion while religion may still be left to individual choice.** The reverse was true in the middle ages.

These missionaries of sanitation, so necessary at the present time, must be drawn from somewhere. They will be drawn from some trade connected directly or indirectly with the plumber and his work. They will not be drawn from the watch-makers, the carpenters, sailors, coal-heavers, or the fruit-peddlers.

They will be taken from the plumbers, the heating and ventilating engineers, the medical profession, the school teachers or the politicians' proteges. These stand in natural line of choice to meet the future extraordinary demand for position-fillers in the new sanitary departments. It will bring into being, in the course of time, a number of steady appointments to positions for guarding different departments of the nation's public health. It is important that the missionary work which is going to be undertaken during the next ten years to make this development possible—we repeat that it is important that the missionaries themselves shall be well appointed, well versed in the gospel and have the proper grit and staying power to adhere to first principles without being swerved and swayed by

the many opposing influences and positions to which they will be subjected.

How are we going to know whether this missionary work is being done properly? We are not going to know it, unless we evangelize ourselves first. It should be the business of every plumber and steam-fitter in the United States, whose life-work and its growth depend so largely for their profit and continuance on the general stability of this sanitary movement, to educate themselves to their fullest measure along sanitary lines. Age should cut no figure. No journeyman plumber is too young to commence the work of preparation.

One of the most encouraging and up-lifting examples of late years along sanitary lines is involved in a recent newspaper paragraph announcing that the Reverend Lambert Louis Conrardy is dying of leprosy among lepers in Canton, China.

One of the greatest exemplars the world has known of courage and pertinacity in the enforcement of sanitation was, or is, if he still lives, Conrardy. Born in Belgium, in 1841; educated to the missionary priesthood; ordained in 1867; he served 7 years as a missionary in India, and then 14 years as a teacher of religion and cleanliness to the Indians, in the northwest territory of the United States. He passed through the Indian wars in safety, was recognized as a friend by President Cleveland and became during those days a naturalized American citizen.

In 1888, the immortal Father Damien needed assistance in his self-sacrificing work among lepers in Molokai, and Conrardy offered the assistance in person. He succeeded Damien in his work and when the colony no longer needed him, he proceeded to Canton, China, where he heard the lepers were in a frightful condition. Upon arrival there, he found they needed medicine and the knowledge to administer the medicine properly. So this pioneer in sanitation to the lepers, at the age of 56, reached Portland, Ore., and went to a medical college to become a doctor on their behalf and he passed his examination. **Man is not too old to learn if he has the will to do so.**

Returning to China later, he found himself hampered by the extent of the work and the lack of funds. After ineffectual appeals to supposed-to-be sympathetic sources, at the age of 66, he came to the United States to secure enough money to carry on his single-handed work. He spoke in Chicago several times in 1908. In two years he had gathered $30,000, and on his return to Canton, he purchased an island 60 miles from that city and transferred his lepers there, and acted as sanitary inspector, chief physician, head cook, office force and executive head for the whole colony at the age of 69. They say he is dying but Spurgeon used to say that "they say so" is half a lie. In this case it is a whole lie. A man like Conrardy never dies. He is unkillable.

Let me tell you that providing sanitation to a leper is a different proposition from acting as sanitary inspector to the city of Syracuse, N. Y. This man had the missionary spirit. He knew enough to learn what he wanted when he wanted it, no matter what his age. He had grit enough to gather $30,000 single-handed by personal visit at the age when most men want to potter round the garden. He alone was able to secure it, for the money never came to him by previous appeal. He came to get it and took it and when he got it he put it into a sanitation scheme for a bunch of leper outcasts.

If any of our readers have given any serious contemplation to the changes in national sanitation that are being heralded at conventions by hints and paragraphs and papers and feel faint-hearted, believing that the odds are great, a thought of Conrardy and his wonderful career should stimulate them to absolute confidence in the ultimate triumph of their efforts. Ten thousand plumbers animated by the Conrardy spirit would produce great changes before the year is out. Let us trust that the changes may come as quickly as we hope and let us see to it that the missionaries for the new movement are drawn from the ranks of the plumbing and heating engineers of the country as much as from the other lines mentioned in the early part of this article.

PITTSBURGH AND VICINITY.

R. B. Mellen, of the Pittsburgh banking house of that name, has let the contract for the erection of a $300,000 residence, and the contract for the renting has been awarded the Baker-Smith Co., whose local branch offices are in the Frick Bldg., Pittsburgh.

* * *

The semi-monthly meeting of the Pittsburgh Master Plumbers' Association was held in their headquarters in the Lewis Block, Sixth Ave. & Smithfield St., April 19th. The association is making a special feature of late of being addressed each meeting by some one well-versed technically in some special theme. At this meeting, Dr. J. T. Edwards, of the Pittsburgh Bureau of Health, spoke entertainingly upon "Sewage Disposal."

* * *

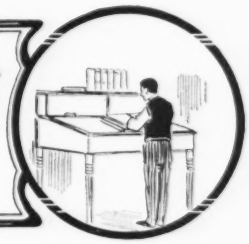
The Gibson Plumbing & Heating Co. formerly located at 547 Ammon St., Homestead, Pa., has moved to larger and more adequate quarters at McClure Ave. and Seventh St., Homestead. The new location is more central and is fixed up and equipped in the most modern style. An elaborate display room is being fitted up, where a large and complete line of plumbing and sanitary fixtures of all kinds will be carried on display. The concern reports that it is very busy this spring, and that it has a number of fine residence and apartment contracts well under way.

* * *

The McGinness-Smith Co., 217 First avenue, Pittsburgh, has been awarded a fine contract which calls for the steam heating system that will be installed in the fine new building for the Presbyterian Hospital that is being built at Montgomery and Sherman avenues, North Side, Pittsburgh. The building was started some time ago, but work was stopped, although the building was well under way, and is now to be completed. The contract is one of the best that has been awarded here this spring. The contract for the plumbing system for this building was awarded to Carson & White, Perrysville Ave., North Side, Pittsburgh. It is a particularly good one, as there will be a large number of the finest sanitary fixtures to install, as well as some of special design and manufacture. The building is so well advanced that both the plumbing and heating contracts can be placed under way at once.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD



SHOULD WORK EVER BE TAKEN AT A LOSS?

Editor "Domestic Engineering": I notice in your new department "X. Y. Z." asks whether or not a master should ever take work, when he knows he is going to lose money on the job, and I notice your answer to same. Now, Mr. Morgan's paper was a mighty good one, yet I don't think your remarks cover the entire ground. I believe that there are certain conditions under which a man may take a contract at a loss. The other lines of business have at certain seasons of the year "leaders" which in some cases they sell at a loss in order to induce custom.

I believe that when a man enters new territory with the intention of staying, that it is his duty to himself to land the first job regardless of cost. At a profit, of course, if possible, but land it.

I know that on the first job, I once got in some new territory, I lost $35; yet, having that job to show, I was able inside the next year to land eleven other jobs and I did not try to make up on the others what I lost on the first either.

This is not the only instance of the kind either, as I have known of several others in the business who have obtained a foothold in new territory in the same manner, and I believe if the readers would be honest and write in their experiences there would be other instances given in a goodly number.

I regard the money ($35) I lost on that job as just so much money spent in advertising and I consider that it was an ad mighty well placed, for I know that it brought me over $1,500 profit.

New York City. Sodus Bay.

HOW THE CHURCH JOB WAS FIXED.

Editor "Domestic Engineering":—I thought that you had forgotten me so I sent a gentle reminder last Wednesday, but I have now received your valuable paper. As usual I find it full of interesting matter, but what got my fancy this time was the article signed "Kentucky." I don't believe in doing a job, when it takes brains, for sewer-diggers wages, and I always had a fancy for the jobs at which somebody got stung, for to me it has been the best advertisement. Just to give you an instance: Last month the foreman came to me and said, "I want you to go over to St. Joseph Church, and see what you can do with the heating plant. It used to be hot water, but as the radiator never got hot they changed it last year to steam and put in an oil burner, but could never get one pound of steam. I don't believe that you can do anything with the old contraption, so go easy and see what you can do." Now my rule is never to promise anything, and think if I succeed, the surprise is so much greater and the work better appreciated. So the first thing I did, was to exercise myself and helper in navigation, that is, we navigated on our stomachs for about 300 feet under the floor. I always have found navigation a great adjunct to plumbers and despite the fact that I have seen some of the craft navigating a dozen schooners across a bar, I still hold my own even to my helper who is only half my age. So after taking the latitude and longitude between piles of old bricks, broken bottles and other antedeluvian remains, I found hitch number one. The man who ran the pipes must have been conscience-struck, when he had to bore through beams of a church, so he simply went 6 inches down, then connected with the return and finally went up again to continue his run to the next radiator, with the consequence that the steam instead of going into the radiators went into the return. The next beam was treated the same way. Well for about three days I got all the navigation coming to me, and while the good people above me were singing praises to the Lord, I was taking inventory of my anatomy to find out whether everything was present and accounted for, as we used to say in the army. To be sure, I cut out first half of the radiators on the first trail. As it was a double circuit coming within about 10 ft. of meeting, I cut one return out, and brought the pipes so as to give them a pitch one way, then I formed a loop and brought the end of both supplies into the remaining return. Well, the first trail with half the radiators in action, brought 5 lb. of steam and a smile on the foreman's face. It had been a forlorn cause before. "Well," said he, "you won't get any pressure, but if you only get the radiators warm, it is more than was done in 30 years since the plant was put in".

I must say that we have a good foreman. He never swears, I never saw him angry, and any of the boys would be willing to go pretty close to the hot place for him and the boss. They had been talking about taking the boiler out and so on, but as the church was in debt, it was hardly possible. So the foreman was really the man behind the gun, but he did not fly off the handle like some do, but simply said, "do your best." I tell you we did. If I remember right, a human being is supposed to have about 280 bones in his body, but the way I felt and my helper grunted, somebody must have made a miscount for I swear that whenever I touched my skin, I could feel a bone.

At any rate, I hooked up the other radiators and took a squint at the boiler. It was one of the old ones made of a 2-in. pipe with returns, and baffle-plates between each layer of pipes, and instead of arranging them so that the flame would strike all the flues, it simply went out of the combustion chamber into the flue. So I put my thinkbox to work and finally had it so that I thought that certain of the highfalutin animals, you call B. t. u., would leave their trace behind them. And to be sure, that the foresaid B. t. u. would have the facility to make their appearance, I devoted a good deal of attention to the oil burner. I soon found out that it had not been cleaned since Heck was a pup, and after removing all the carbon I could find, and it was a good portion, I was ready to have a smoke, that is, not in the chimney but in my old double saturated corncob. No there was no smoke in or out of the chimney, you can bet your last button, for whenever I see smoke coming from an oil burner, I know

that the darling B.t.u's. are trying to see the little angels instead of attending strictly to business. Oh, yes. I built an arch to bring the flame towards the door and so increased the travel it had to make. To make it short and sweet, in about three quarters of an hour, I had 8 lb. of steam, the pop blowing off and all radiators hot and this with half of the pipes without any covering. And everybody is happy. The people don't have to sing any more with their teeth chattering. As the rector said, we earned our money and the boss and foreman got the credit for making out of somebody else's failure a success. Anytime give me a job where somebody got stung and is real mean and cranky; they are the customers I want.

I was called on a steam pump job one time, that would not work. The pump was no good. The engineer put it up himself, knew all about it and so on and so forth, and he did to be sure, only he put the exhaust where the live steam ought to have gone, but such things happen in the worst regulated families, just as twins are born once in a while.

Give me a good strong job first, last, and all the time. It is the job to bring the trade forward. Don't run anybody down for we all make mistakes, but let us show them the best that is in us.

Yours for the uplifting of the trade.

San Jose, Cal. Bill, the Plumber.

SHOULD GOODS BE TAGGED WITH THE PRICES?

Editor "Domestic Engineering":—In looking over the different shops and into the windows wherein both plumbing and heating goods are displayed I can remember only one or two places, where I saw the prices marked on the fixtures in any manner whatever.

What is the objection to marking the price on a closet or lavatory or tub in plain figures, so that anybody can see exactly what you sell it for?

The article has to be sold, you have got to tell the price in order to sell it, now why so much secrecy? Or is it like many other things in this business—keep it quiet. Somebody might get an idea and that would be strictly against all precedent. I should like to hear from some others on the idea, I advance.

Marker.

A NATIONAL HEALTH BUREAU.

Editor "Domestic Engineering":—I send you herewith a clipping, taken from a Chicago daily paper, which seems to show that the people are waking up along the line of the health of the public. The clipping in full follows:

"In the course of a comprehensive argument in favor of concentrating all federal health activities into one department, to be conducted in co-operation with the health departments of the various states, Senator Owen of Oklahoma presents some novel aspects of sickness and its importance to the nation.

"Preventive measures known to science would add years to the average of life, prevent a daily loss of more than 1,700 human lives, insure good health to 3,000,000 sick from preventable causes, and save, according to experts, more than two billions of dollars each year to the people of the United States.

"If even a small fraction of the possible benefit can be secured merely by co-ordinating the government health bureaus and establishing a national department of health, no time should be lost in bringing about the change, purely as a common-sense matter of dollars and cents.

"When the enormous abatement of human misery that must concurrently be effected is taken into consideration, the importance of a national health division of government, in charge of a capable cabinet officer, who should be a medical expert of the highest rank, assisted by a corps of able scientists, is beyond question."

Now while the ideas in this article are all good enough as far as they go, why would it not be a good idea to bring up the matter, before the Master Plumbers' Association in June, of a National Plumbing Superintendent, Inspector, Secretary or whatever title you may care to give him? It is becoming more apparent every day that there are many positions open to men of our craft, who should not hesitate to assume the responsibilities which the times are developing.

Progress.

SEWER-GAS IN THE BIG INDIAN COUNTRY.

Editor "Domestic Engineering":—I see in your issue of April 16, 1910, a gentleman by the name of Sherwood from Billings, Montana, takes occasion to roast me on my remarks regarding the buga-boo "Sewer-gas (?)" Any person, who has lived for a few weeks in a large city, knows that the nasal passage and lungs of people, who are compelled to travel the streets, become filled, more or less, with the dust, soot and dirt which blows about the street constantly.

The lungs of the average city dweller are spotted all over with patches of foreign matter. It has also been proven beyond dispute that this street air contains dangerour germs—more so than the sewer air. Now, if Mr. Sherwood will get some books and read up on the subject, he will find a great many surprises in store for him, if he will free his mind from prejudice. The mere idea, of which he would prefer, cuts no ice in the matter whatever.

The man who cannot land a plumbing job without scaring the owner into it by preaching about sewer-gas isn't very much of a salesman. I did not rely, for my arguments, on my own preferences but took the results obtained by men who had studied the matter for years.

But all the same this is a free country and every man can have mostly his own ideas.

"Phoenix."

No further contributions on Sewer-Gas will be published unless entirely new matter is presented. The smartest men in the business have had their say by this time, and we and our readers are thoroughly convinced that there is sewer-gas or else you couldn't argue about it and also that there is no sewer-gas or else the investigators would have been dead long ago. We also do not like bad smells and want to have them removed by all means possible, regardless of their possible benefits as tonics and system-builders.

MILWAUKEE'S NEW MAYOR PLANS FREE PLUMBING FOR THE CITY'S POOR.

A city plumbing department which shall be devoted especially to placing plumbing and sanitary improvements at cost in the homes of the poor in Milwaukee, is one of the first fruits of the new social democratic administration. Mr. Seidel is also searching the country for a health commissioner for Milwaukee a man of ability, willing to take the job with a salary of $6,000 a year and who will devote his time exclusively to the office.

An Interesting Steam Heating System in a Large Institution

By H. Anderson, Peekskill, N. Y.

St. Joseph Home occupies a picturesque spot on the southern edge of Peekskill, N. Y. and commands an extensive and magnificent view of the Hudson River. The home is one of the institutions of the Franciscan Sisters, a church and a group of buildings adapted to the care of about 1,200 children.

Some of the buildings are heated by steam, but a large barn, the conservatory, the church and a new school

Fig. 1. The St. Joseph School, Peekskill, N. Y.

building, are heated with a system that will be described as applied to the school house. Steam is supplied for all the heating from a detached boiler house that is of lower elevation than the other structures, which facilitates a return of the condensation to the pump receivers. A low-pressure system is maintained for the older steam heated buildings, and a battery of high-pressure boilers provides steam for a large electric light plant, pumping,

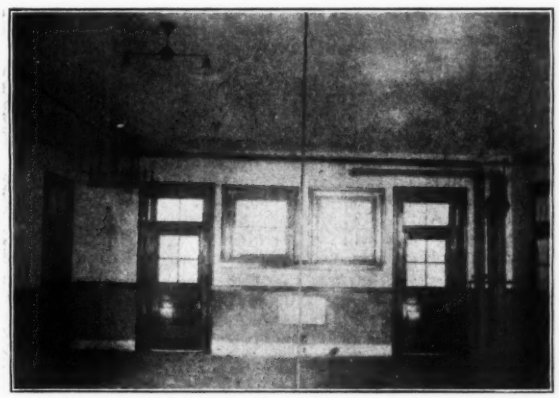


Fig. 2. The Inner Hall on First Floor.

laundry, and the hot-water heating. It is called high pressure, although it averages 85 lbs.

The school building, Fig. 1, is a new structure of brick, five stories high. The basement or first floor affords play-rooms, sanitary toilets, bath and shower bath rooms. There are sixteen school rooms above the first floor with special teachers' rooms, all equipped as required by school house regulations. The heating is by direct radiation, and ventilation is afforded from indirect stacks steam heated, and electrically driven blowers. The building is 600 ft. from the boiler house, and is connected with

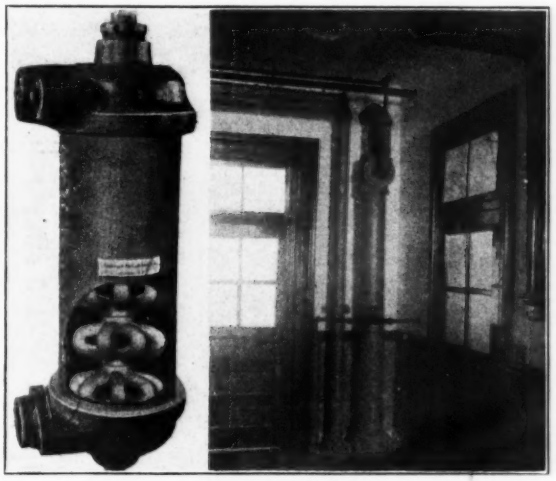


Fig. 3. The Heater. Fig. 4. Another View of the Heater.

the boiler by a steam-pipe, and a 1½-in. return. The pipes are suspended centrally of 2-ft. tile-pipes, and these pipes are placed in a concrete tunnel 3 ft. in diameter.

Fig. 2 shows the interior of the first floor inner hall, where the steam main begins its work on the heating system. A 2-in. pipe is seen entering the wall just back of the group of valves in the upper left hand corner. In

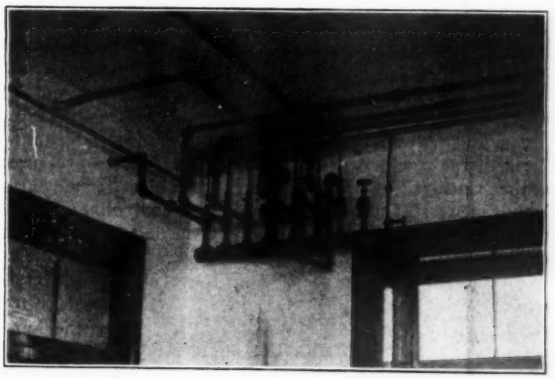


Fig. 5. A Group of Valves.

the opposite corner is the heater that warms the central part of the building. The heater is similar to that shown in Fig. 3, and consists of 8-in. pipe with heating sections for steam inside. The main from the heater is a 4-in. pipe, which passes through the wall back of and just above the heater. Above the door at the left of the

heater the main re-enters the hall and returns to the bottom of the heater.

From the group of valves in the left hand corner of the hall, a 1-in. steam-pipe can be traced across the hall, where it enters a branch from the side of the top of the heater. Another 1-in. pipe piercing the wall just above the wainscoating is the steam-return. A second 1-in. pipe from the group of valves passes through the wall to the right of the heater, and supplies steam to a second heater on the other side of the wall. A third pipe entering the wall to the left of the valves supplies a third heater on the other side of the wall. The visible heater heats the central portion of the building, the one on the other side of the right hand wall heats the north wing, and the heater on the other side of the left hand wall heats the south wing of the building. Each heater is independent of the others, and each heats nearly three thousand feet of radiation, and the three are alike in size.

Fig. 4 is a better view of the heater. The pipe taken from the end of the return leads to the expansion tank. Fig. 5 is a clearer view of the group of valves. The three to the left are connected to the heaters described, the three to the right supply the ventilating stacks. It will be observed that the valves are of the lock-and-shield variety, and that rods extend from them up through the ceiling.

In the hall just above the valve-group in an alcove, Fig. 6, the rods extending from the valves below, are arranged on a shelf, with locks and shields on their ends for key manipulation of the gages shown, the middle one gives the pressure at the steam main, which averages five per cent. less than that in the boiler 600 ft. distant. The other three small gages show the steam-pressure in the ventilating stacks. The three large gages are altitude gages. Thus the entire plant is controllable from this point. Just beyond the door at the left is a switch-board from which the ventilating blowers are controlled.

An interesting feature in one of the mains is shown in Fig. 7, which represents the end of the hall opposite to that shown in Fig. 2, the main shown crossing the hall is a part of that supplying the north wing. This main comes from the north wing, entering the far alcove, where it gives off a riser and then drops 8 ft. to pass under an obstruction, partly rising under the stairway and is seen in the toilet room to the right of the stairs, where it rises to its proper level, gives off another riser, enters the hall, supplies the low down radiator on the left, then passes again into the north wing. It should be stated that the mains are single pipe loops of uniform size throughout their entire length. Risers are taken from the tops of the mains, and the returns enter the sides.

The basement is heated throughout with radiators as shown in Fig. 8, which is the smallest radiator used.

There are several points of interest to be noted in this installation. Few engineers would venture to heat a building of this size with a 600-ft. length of 2-½-in. steam main, or undertake to heat one third of such a building with a 1-in. steam supply-pipe, even with an initial pressure of 85 lb. It is understood, of course, that steam is used in the heaters only to heat the water. Obviously, it is the efficiency of the heaters employed that gives the results obtained.

The building has been in use the past winter. It is an isolated building, with a full exposure to north winds It will probably never have a severer test than that of the winter just passed, and throughout the test it gave comfort and satisfaction. No expensive attendant was necessary to look after the system, and altogether the results were as satisfactory as are attained by plants that cost double what this cost, and require skillful engineers to look after them.

To James J. Donovan, the engineer in charge of the Home, is due the credit for the plans and their installations. He is an enthusiast upon the subject of water heating, and he has a lot of good sense to guide his enthusiasm. The heating sections used in the heaters were made by the Anderson-McCutchen Co., Peekskill, New York.

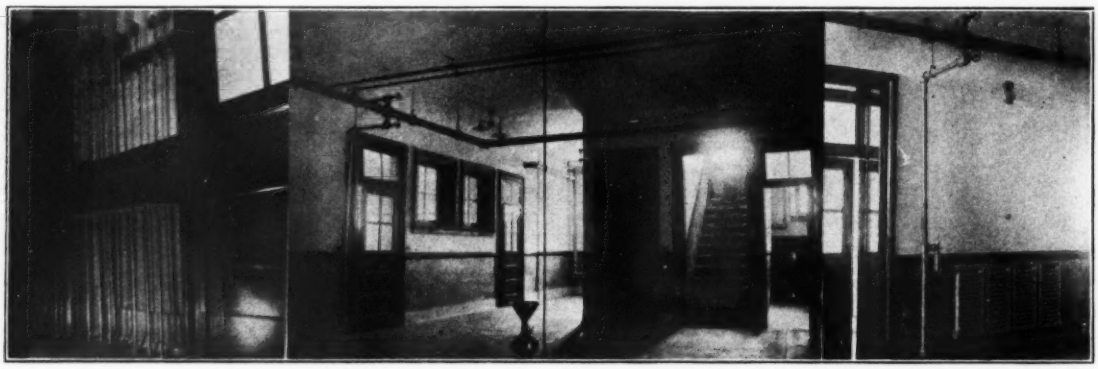


Fig. 6. Alcove above Valve-Group. Fig. 7. End of Hall Showing one of the Mains. Fig. 8. Style of Radiators Installed in Basement.

OBITUARY.

David R. Jones, for a long time a prominent and well known member of the Denver Master Plumbers' Association, died at his home, 2128 West 32d Ave., Denver, on the afternoon of April 11th, after a prolonged illness of several years. Besides his widow, Mr. Jones leaves three minor children, his oldest son having died but a short time ago.

Samuel Wesley Stack, a well-known business man of West Somerville, Mass., died on April 13. He was 51 years of age, and had conducted a plumbing business in Somerville for many years. Death was due to typhoid fever. Mr. Stack was a great follower of school sports and seldom missed a base-ball game or athletic contest of any kind, and was generally known among the young folks as "Dad" Stack.

SECURE HIGHER WAGES.

The journeymen plumbers at Summit, N. J., have secured an increase in wages of 2c per hour, beginning May 1st. The men are now receiving 48c an hour with an 8-hour day.

A PRACTICAL MANUAL OF STEAM & HOT-WATER HEATING

BY EDWARD RICHMOND PIERCE

SECTION IV

Another important reason for noting down at time of measurement the kind and condition of outside wall of each room measured is that, very often the rooms, having porous walls, are on the side of the building most exposed to the winter winds, and moisture with wind in addition, unless especially provided against, will cause trouble for the steam-fitter.

The prevailing winter wind in a town may not be the prevailing wind direction at a given point in that town; thus. while the prevailing wind in the town might be Northwest; at a given point, because of conditions created by eddies, a room or a house may receive its winter wind from a point of compass somewhat different. The points of compass should always be included with the pencil sketch of floor plans of house, and they should always head the lists of measurements.

This sketch need not be finely drawn or in great detail, but should always be given. The contract may not be awarded at once; conditions of structure may be changed after your measurements; memory regarding the relative position of some room may fail; many things may arise that would make the rough sketch of great value. It takes but a moment to make it, and later, may save a long trip and hours of time. Never neglect the rough sketch even on the simplest jobs.

When measuring for square feet of window-opening or frame, special attention should be given to the manner in which the work of setting window-frame has been performed. A great many instances will be found where, if the finish boards were removed, an area equal to anywhere from one to three square feet of surface would exist where the only protection is the finish. Around these finish-boards, there will be a leakage of heat requiring careful attention. The leakage in a well-built house will usually equal twice its cubic contents per hour from the first-floor rooms, where the doors opening to outside usually are in excess of similar doors on second floor. Second-floor leakage is rarely less than the equal of the cubic contents once an hour. If, however, careless construction around doors and windows permits a still greater loss, some provision for radiator surface to offset the excess loss must be made.

From the foregoing, the absolute necessity of complete data as indicated will be readily understood, even at this very early stage of the proceedings. Later, when we come to figuring heat-losses, and selecting radiator surface, piping, and a suitable boiler, the value of this preliminary accuracy becomes startlingly apparent.

It should be distinctly understood that there is no "short-cut road" to successful steam-heating, and it is equally true that there is no mystic knowledge required. The whole proposition of house-heating is founded on a common-sense understanding of a very few natural laws. The very first of these is that, if two units of heat are taken from any larger number of units, two units added will make up for the original loss. The profession of steam and hot-water heating is not as yet an absolutely exact scientific profession in its application because of the varying conditions imposed. But it is scientific and exact when applied to an unvarying condition. The action of heat upon air, water and various substances has been ascertained from scientific theory and experiment, to be always the same under the same conditions. The more completely the conditions are ascertained under which heat may pass from a warmer to a colder condition, the more accurate can the provision for exactly supplying the needed heat to maintain the warmer body at a uniform temperature be made.

From the measurements of all the rooms to be heated we must be able to secure the following details as a base of further and final figuring.

The cubic contents of each room.
The square feet of real exposed wall.
The square feet of wall exposed to colder rooms.
The temperature of colder adjoining rooms (usually 32 degrees).
The square feet of window-openings.
The square feet of outside door-openings.
The square feet of floor exposed to outside air.
The square feet of floor exposed to cold cellar (usually 32 deg.).
The square feet of floor exposed to colder room(usually 32 deg.).
The square feet of ceiling exposed to colder room.
The square feet of ceiling exposed to outer air.
The kind and condition of walls.
The direction of prevailing winter wind.
The relation of each room to point of compass.

The data of any other fact bearing upon probable loss of heat from any room which it is proposed to maintain at a steady temperature.

We are then ready to consider the probable loss of heat through each factor mentioned.

To Determine Amount of Heat-Loss From Rooms in Buildings—Effect of Altitude.

The cubic contents of a room has long been the factor upon which guesswork rules have been hung. One man requires the use of one square foot of radiation for every 30 cu. ft. of air; another says you must use one square foot for 50 cu. ft. out of the total cubic content. A third man says you must use judgment (which is certainly sane and sagacious advice) and use one square foot to from 35 to 60 cu. ft. All sorts of rules have been advanced from time to time which, without question, were practical rules for a certain locality and a certain type of building, but which, under other conditions, would be without value. One noticeable omission in all "Rules of Thumb," as Professor Carpenter, of Cornell

University designates them, is that none of them state what pressure of steam is to be carried or what temperature the water in a hot-water job is supposed to attain.

If a room with 2600 cu. ft. of contents is to be heated from a radiator based upon the ratio of 1 to 30, or say, 87 sq. ft. by one man; and the same room is to be heated by another with a radiator based upon a ratio of 1 to 60, or say, 44 sq. ft.; it is evident that the temperature of the steam in one radiator must be much lower than in the other.

Yet, each man might secure the same results in room temperature, the reason being that the first man might require a pressure at his boiler of 5 lb. per sq. in., and the second man would need approximately a 30-lb. pressure per sq. in. at his boiler. This one illustration is sufficient to show the absurdity of competing for steam-heating work when only 70 deg. in the room is required and the job is to go to lowest bidder, nothing whatever being said by owner or architect in regard to pressure to be carried.

But supposing it is stipulated that only 2-lb. pressure is to be carried at the boiler, which ratio rule would you select?

Again, suppose one has graduated from the ratio-rule class, and is using some rule based upon exposed wall and window surface—

Does he know what pressure he must carry to make the rule universal? Will the same rule that works perfectly in results when applied to a house in New York City, or Boston, give the same results when applied to a house built from the same plans, by the same builder, using throughout the same quality of material at Denver? A trial convinces that at zero outside, the rule that gives sufficient radiation to secure 70 deg. in a house in New York or Boston will not heat to 70 deg. a similar house in Denver, with the same gage pressure.

There can never be a result without a cause. It is also evident that a rule that **does not meet all conditions is incomplete.** In order to clearly explain the cause of such varying results, we must investigate more fully. If we find that a ratio-rule that works out well in Boston fails utterly in Denver or Leadville, Colo., or in the "Land of the Sky," North Carolina, reasons for the discrepancy must be sought and found.

Those rules are worthless, not only because of difference of temperature in places named, but they do not work out in practice at the same outside and inside temperatures because of difference in altitude.

The steam that is produced at approximately 212 deg. F. temperature, is produced near sea-level under a barometric pressure equal to 29.905 in. of mercury, or as usually stated at 30 in. mercury-pressure. This just balances the weight or pressure of the atmosphere at sea-level.

As one ascends above the sea-level, this pressure or weight grows less and less and consequently steam is produced from water at a correspondingly lower temperature, in other words, it is not as hot.

The decrease in atmospheric pressure, as one rises above sea-level, is not exactly constant, as shown by the sinking mercury in the barometer, but approximately, the barometer-mercury sinks one inch for each 1,000 ft. above the sea-level.

The Encyclopedia Britannica, Vol III, Page 387, gives the following table of the boiling temperature of pure water at different pressures of mercury:

TABLE C.

Temperature Fahr. at at which Water Boils under varying Barometer Pressures.	Barometer Inches of Mercury.
212	29.905
211	29.331
210	28.751
209	28.180
208	27.618
207	27.066
206	26.523
205	25.990
[illegible]	25.465
203	24.949
202	24.442
201	23.943
200	23.453

For practical purposes, in determining the amount of heat a square foot of radiator surface will emit at different altitudes with steam or hot water as the heating medium, it will do to assume that a decrease in the atmospheric pressure due to altitude equivalent to one half-inch of mercury occurs for every 500 ft. above sea-level, and a corresponding drop of one degree F. in the temperature of steam, or if you prefer, in the boiling point of water, or of the point of evaporation.

In other words, steam without pressure other than that of atmosphere is one degree F. hotter at sea-level than it is 500 ft. higher up, and at 1,000 ft. above sea-level, steam creates at 210 deg. F. This is, as will be seen by table C, within 154 thousandths of an inch of corrected mercury-height of barometer-pressure for 1,000 ft.

On this basis the boiling point of water, or the temperature of steam at various altitudes can be figured with sufficient accuracy for house-heating purposes as per table D.

TABLE D.

Feet above sea-level.	Boiling point of Water or Point of Evaporation into Steam. Degrees Fahr.
0	212
500	211
1,000	210
1,500	209
2,000	208
2,500	207
3,000	206
3,500	205
4,000	204
4,500	203
5,000	202
5,500	201
6,000	200
6,500	199
7,000	198
7,500	197
8,000	196
8,500	195
9,000	194
9,500	193
10,000	192

As the number of heat units given off or emitted per square foot per hour from effective radiator surface is determined by the difference of temperature between the surface of the radiator and the mean temperature of the surrounding air, it is very evident that the temperature of the heating medium at its point of evaporation becomes

a most important factor in applying a ratio-rule or a rule with an unknown estimated pressure at its base.

At this point another most important fact comes in The steam in its circuit from b ler through radiators and piping back to boiler drops in temperature very materially. For this reason, only averages are considered for general heating deductions when determining radiator surface for house-heating. Unless such deductions are made serious errors are liable to occur.

By common consent the trade from every section of the country seems to have adopted as a basis in hot-water heating a drop of 20 deg. as being what may be safely considered the drop between the temperature of a hot-water job at the boiler and at the end of complete circuit. Thus if the water leaves boiler at 180 deg. F. they expect it to return to boiler at 160 deg. and they figure most of the radiation should have an average temperature of 170 deg. [180° + 160° ÷ 2 = 170°]. Curiously enough, the inevitable drop in temperature of the steam in a house-heating job seems to be pretty generally overlooked by the average steamfitter. But it is there just the same, and now that definite pressures are being called for by manufacturers, owners and architects, it must be considered at all points.

Those American authorities who have written on heating have quite fully indicated this loss, but in giving out rules have usually covered it with a blanket under the guise of a factor of safety, but this factor, as will be often found upon analysis, is like many of the rules, only strictly applicable within a limited area of territory and of altitude.

THE PLUMBING INSPECTOR AND THE BOARD OF HEALTH.

By Thos. J. Claffy, Chicago.

In nearly every state in the union laws have been enacted, establishing boards of health in towns and cities for the conservation of public health.

These boards of health have been endowed with extraordinary power and authority. They are empowered to make rules to safeguard the public health, and in many instances these rules have been upheld and sustained in courts of law. In large cities ordinances are passed which take the place of rules in order that prosecutions under the municipal act may be facilitated.

One of the fundamental laws on which boards of health stand is that adequate light and ventilation shall be provided in domiciles and places of employment. The basic law of hygiene which is insisted upon everywhere is cleanliness, and removal of wastes, and without plenty of light and ventilation there can be no cleanliness; hence it is that laws and rules or ordinances are enacted by states and municipalities, containing specific requirements for light and ventilation, plumbing and drainage. Our modern system of plumbing is but the result of ages of struggle for cleanliness in the equipment of home and workshop.

In states which have enacted such laws, responsibility for enforcement has been placed upon the boards of health. Such boards in cities and towns are required to approve all plans and drainage within buildings. They are also responsible for the proper installation of plumbing. In small towns this service is usually performed by the board of health, and in cities where public moneys warrant the expense, by a plumbing inspector, who is also the employe or representative of the board.

Ordinances or rules are enacted by the proper authorities, which usually specify certain requirements of a recognized standard for the ventilation, light and plumbing installation in buildings. The enforcement of the requirements of rules or ordinances is the duty of the plumbing inspector. His power and authority are no greater than their source. This is determined in the statutes. The authority invested in boards of health is almost universally upheld by the courts.

The details of rules or ordinances are sometimes unreasonable or otherwise faulty and may not be sustained, but the broad question of maintenance of public health is so vitally important that our courts are very careful to uphold such boards in all things within reason. A recent decision of the supreme court of New Jersey, upholding the validity of a law requiring the approval of plans and specifications before the installation of any plumbing is of considerable importance. In this state the board of health has jurisdiction over such installations. We are not aware of any instance in which a similar decision or one of equal importance has ever been given, where the jurisdiction was vested in a building commissioner or board of public improvements. In several cities, such as Cleveland, St. Paul, New York, etc., the building commissioner has jurisdiction over plumbing installation, while in St. Louis it lies with a board of public safety.

In New York the board of health requires adequate ventilation and light for all buildings, and certain necessary plumbing facilities, before the approval of plans and specifications, but the building department is responsible for plumbing installation and quality of materials. This double system of inspection is not practicable in smaller cities or towns on account of its prohibitive cost. The wisdom of clouding a question at issue—and plumbing installation is always a question at issue—by a dual responsibility is not, to my mind, quite clear. Under the law, the commissioner of buildings is authorized to enforce the requirements of laws and ordinances making for the safety of life and limb, the intent and purpose being to provide safeguards in the erection and construction of buildings, and to require a grade of materials which, in the ordinary course of events, will not endanger life and limb.

The law empowering boards of public safety with authority may endow them with broader powers than are vested in a building commissioner, but we doubt if they are as broad as those vested in a board of health. If the building commissioner is vested with authority only for the safety of life and limb, with regard to the construction of buildings and the quality of materials, how can an action for preservation of health lie, when based on ventilation, light or hygienic sanitation, and how can a board of public safety act in a similar case? Such a board will not be upheld in any action outside its authority and such authority is vested only in a board of health.

The tendency is to bring the plumbing inspector within the jurisdiction of the building commissioner. This system is more convenient in many ways for the plumber and contractor. In some cases the plumbing inspector is independent of any board or commission and is, in reality, a cabinet officer or department head. The risk in either case is great and not justified by the greater convenience to the public, or politics.

There is in the minds of the people a common feeling of respect for boards of health and laws which they are required to enforce, and any law or rule for the

*Read at the fifth annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, held at Trenton, N. J., Jan. 20-22, 1910.

conservation of public health is at once strengthened in its application, as compared with any law which requires a building commissioner to enforce standards in materials and structures which ensure the safety of life and limb.

Authorities on hygiene agree that bad plumbing is a menace to health. This fact is so well established that its further discussion is unnecessary. Ordinances governing plumbing installation are usually open to criticism in some respect. Sometimes their validity is tested in court and the common result is a defeat for the plumbing inspector, if the case be carried to a high court. The specific requirements are small matters in such instances, as an amendment is easily enacted, correcting the fault and no great damage done. But if the root of the thing be attacked—the enabling power and source of authority—and the case decided adversely to the plumbing inspector in a high court, then indeed the case is serious. If there is any weakness in the authority upon which a plumbing ordinance is based, the inspector's first duty should be to have the proper corrections made. The enforcement of any law is always a hard task, and the surest way of commanding respect for any law is to make it sound, strong and logical.

Good health depends, to a great extent, on good plumbing, and good plumbing, in a general way, on good laws and ordinances. The enforcement of the latter are matters for the plumbing inspector. Very often his position is assailed by unscrupulous builders and contractors. If his position is not safeguarded by good laws, he goes down in defeat. Obviously his duty is to require certain standards in plumbing installation which are recognized as proper and safe from a hygienic standpoint. Hygiene is the watchword of every board of health, hence the plumbing inspector should be under the jurisdiction of a board of health.

NEW ENGLAND NOTES.

The contract for plumbing work at the city almshouse at Fall River, Mass., has been awarded to Nathan Miller, who was the lowest bidder. There were four bids received for the work.

James McDonough has rented a store in the Merritt building at Houlton, Me., and has opened a plumbing and heating establishment. He has many years' experience in this line of work and his success is assured.

William J. and J. Wilson, Manchester, Conn., have formed a partnership, under the firm name of Wilson Brothers, to carry on a plumbing business. They have located in the Trotter block.

The contract for heating the new Y. M. C. A. building at Attleboro, Mass., has been awarded to Libby & Bond.

The H. H. Barber Plumbing & Heating Co., Milford, N. H., has just closed a large plumbing and heating contract at New Ipswich, N. H.

Smith Brothers, Leominster, Mass., have the contract to do the plumbing and steam heating in Ellen T. O'Connor's new house on South street, Fitchburg. The same firm has the contract to install new plumbing in the house of Patrick Higgins at Eden Glen, and new plumbing in the residence of W. H. Gould, Beacon St., North Leominster.

A. E. Ball, Saco, Me., is having his plumbing establishment entirely renovated and while the work is going on is occupying quarters in an adjoining store.

Andrew F. Granara, a plumber located at 111 Richmond St., corner of North St., Boston, Mass., suffered a heavy loss in a four-alarm fire which swept the block at that point, April 14.

J. B. Farnsworth, Leominster, Mass., has the contract to install new plumbing and steam heat in John Lavin's new house on Cottage street.

Owen E. Blackdon & Co., who have conducted a stove and plumbing business at Dexter, Me., for several years, have sold out to Harry Tillson. Mr. Tillson was formerly connected with the firm of Crokett & Tillson.

Warren F. Blaisdell, a plumber of York, Me., is anticipating the busiest summer in his business history. He adready has several large contracts on hand and is now looking for extra help that he may keep pace with his orders.

The contract for heating the new high school at Springfield, Mass., has been placed with Donnelly, Holyoke, Mass. It will be necessary to install a plant large enough to heat the old high-school building as well as the new one.

Robert Robertson, Beverly, Mass., has the contract for new plumbing to be installed in the Smith House at West Manchester. The house is being thoroughly remodelled and up-to-date plumbing fixtures are now being installed throughout.

Desmarais & Bourret, Lowell, Mass., have the contract for the plumbing in two new houses which are now under construction for Jacques Boisvert on Beacon street.

A force of men in the employ of the Kaufman Heating & Ventilating Co., Columbus, O., are working on the new addition to the mill at Stonington, Conn.

Wales & Hamblen, Bridgeton, Me., have the following contracts in hand: hot-air heating plant in newly remodelled house of S. F. Heald at Lovell, Me.; hot-air engine, plumbing outfit, bath-room and other fixtures in cottage at Kezar Lake, Lovell; plumbing for Mrs. F. W. Robinson at Naples, Me.; water-system, bath-rooms and other work in cottage of C. W. Proctor at Bay of Naples.

The Lyon Co., Inc., Leominster, Mass., have the contract to do the sprinkler work, heating and plumbing in the addition to the factory of the Jewett Piano Co., on Adams street. They also have the contract for gas-piping and plumbing in Mary Boutelle's new house on Blossom street; for installing new plumbing in the residence of Everett Page on Church street and the plumbing in James Cleary's two-family house on Manchester street, Leominster.

The master plumbers, Lowell, Mass., have practically agreed to the request of the journeymen for an 8-hour day.

The bids for heating and ventilating the new high-school building at Willimantic, Conn., have been received but no contracts have been awarded. The bidders were: Moriarty & Rafferty, Willimantic; Lynch & Wood, Boston; C. H. Sanborn and E. D. Burroughs, both of Boston.

The town of North Brookfield, Mass., has appropriated $4,000 for making improvements at the High and Grove school-buildings, the improvements to include the installation of a steam-heating plant in the Grove school.

J. D. Cowles, Manchester, Conn., has opened a steam-fitting establishment on Hilliard street.

William R. Frazier, who has conducted a plumbing business in Middletown, Conn., under the firm name of Schenk & Frazier, has filed a petition in bankruptcy. His liabilities are listed at $2,261.78. He claims assets of $1,432.83.

Creditors of Daniel F. McCarthy, a plumber and electrical contractor, Waterbury, Conn., have filed a petition in the court asking that McCarthy be adjudged bankrupt.

Bids for heating and plumbing the new addition to the Ledge St., school building at Worcester, Mass., have been received by the superintendent of public buildings, but the contracts have not yet been awarded. There were five bids for steam-heating work and six for plumbing. The Central Supply Co's bid of $6,000 was the lowest for the heating work, and Edward J. Nagle with a bid of $4,642 was the lowest on the plumbing work. The other bids received were as follows:

Heating: Edwin Hawes Co., $6,052; M. D. Holmes & Co., $6,297; M. D. Burlingame Co., $66,490; O. S. Kendall & Son, $6,688.

Plumbing: Field-Fielder Co., $4,676; J. T. Cahill & Sons, $4,723; Tucker & Rice $4,769; M. D. Holmes & Sons, $4,845; J. J. McGrath $5,181.

DOMESTIC ENGINEERING

THE OPEN DOOR TO WEALTH
IN HEALTH

TREATING SPECIFICALLY ON

SANITARY PLUMBING
HEATING
VENTILATING
STEAM-FITTING

ITS ESSENTIAL AIMS ARE THE ADVANCEMENT OF PRIVATE AND PUBLIC CLEANLINESS AND COMFORT AND THE FURNISHING OF STIMULATIVE EFFORT TO THOSE ENDEAVORING TO OBTAIN PERFECTION IN NATIONAL SANITATION.

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NOTICE TO ADVERTISERS.

Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.

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SPECIAL NOTICE TO READERS.

Our readers are invited to send in articles on any topics covering sanitary interests as outlined above. Photographs and drawings with descriptions of special interest to plumbers and steam-fitters are welcomed. "Domestic Engineering" pays at space rates for all articles, notes, criticisms and news data so contributed.

CONVENTION DATES.

May 3 and 4, 1910.—Annual convention of the Pennsylvania State Association of Master Plumbers, at Lancaster, Pa. Convention meetings in the Orange Street Opera House. Headquarters at the New Stevens House. President, Charles L. Titus, 37 Morgantown Street, Uniontown, Pa.; secretary, Harry L. Burd, 85 Gallatin Ave., Uniontown, Pa.; treasurer, John H. Birchall, Allentown, Pa.

May 10, 1910.—Ninth annual convention of the New Jersey State Association of Master Plumbers, at Paterson, N. J. Sessions in the Miriam Barnet Memorial School, corner Broadway and Erie Railroad. Officers: President, Geo. S. O'Neil, 41 Bridge St., Paterson, N. J.; secretary, Henry F. Baillet, 191 Clinton Ave., Newark.

May 11, 1910.—Annual convention of the Master Plumbers' Association of Connecticut, at Hartford, Conn. Headquarters at the Hotel Garde and business sessions at the Putnam Phalanx Armory. The officers of the Association are: President, Thomas P. Cleary, New London; first vice-president, Thomas J. Groark, New Haven; second vice-president, Thos. L. Dowling, Hartford; financial secretary, Geo. S. Bull, Hartford, recording secretary, G. R. Hempstead, New London; treasurer, John Troland, Norwich; national state vice-president, R. T. Rock, Bridgport, Conn.

May 11, 12 and 13, 1910.—The fifth annual convention of the National Supply & Machinery Dealers' Association and the eighth annual convention of the American Supply & Machinery Manufacturers' Association, in Atlantic City, N. J. These conventions will be held co-jointly.

June 1, 2 and 3, 1910.—Second annual convention of the National District Heating Association, at Toledo, O. Headquarters at the Boody House. President, A. C. Rogers; secretary, D. L. Gaskill, both of Toledo, O.

June 13, 14, 15 and 16, 1910.—The 22nd annual convention of the National Association of Master Steam and Hot Water Fitters, at Atlantic City, N. J. Headquarters at the St. Charles Hotel. President, Charles A. Geoghegan; vice-president, Edward B. Denny; treasurer, Juan A. Almirall; secretary, Henry B. Gombers, 260 West Broadway, New York city.

June 14 and 15, 1910.—Joint meeting of the Eastern Supply Association and the Central Supply Association, at Toledo, O. Headquarters at Hotel Secor. The officers of the Eastern Supply Association are: President, P. M. Beecher, Syracuse, N. Y.; first vice-president, John A. Murray, New York City; second vice-president, F. H. Locke, Boston; treasurer, F. A. Bucknam, New York City; secretary, Frank S. Hanley, 261 Broadway, New York City. The officers of the Central Supply Association are: President, Frank Collins, Toledo, O.; first vice-president, Geo. H. Gorton, Kansas City, Mo.; second vice-president, P. J. Frey, Minneapolis; treasurer, E. F. Niedecken, Milwaukee; secretary, Paul Blatchford, 1524 Tribune Bldg., Chicago.

June 21 and 22, 1910.—Annual convention of the National Association of Brass Manufacturers, at Atlantic City, N. J. Commissioner, Wm. M. Webster, 1112 Schiller Bldg., Chicago.

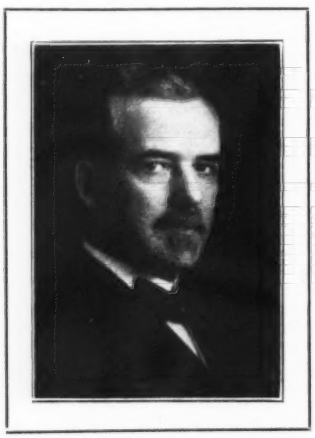
June 28, 29 and 30, 1910.—The 28th annual convention of the National Association of Master Plumbers, in Chicago. The officers of the association are: President, Walter D. Nolan, 721 14th St., N. W., Washington, D. C.; vice-president, A. Selden Walker, 341 Main St., East Orange, N. J.; secretary, Samuel Artz, 3028 M St., N. W., Washington, D. C.; treasurer, William McCoach, 1607 Sansom St., Philadelphia.

June 30 and July 1, 1910.—The semi-annual meeting of the American Society of Heating and Ventilating Engineers, at St. Louis, Mo. The officers of the society are: President, Prof. J. D. Hoffman, Lafayette, Ind.; first vice-president, R. P. Bolton, New York City; second vice-president, S. R. Lewis, Chicago; secretary, W. M. Mackay, New York City; treasurer, U. G. Scollay, Brooklyn, N. Y.

Among the Wholesalers

NATIONAL ASSOCIATION OF JOBBERS OF PLUMBING SUPPLIES ORGANIZED.

A new organization was effected on Monday, April 25th, at Niagara Falls, N. Y., to be known under the name of the National Association of Jobbers of Plumbing Supplies. This organization is the outgrowth of a conference held by a large number of representative plumbing supply men of the United States. The principal object of this new association is to improve the standard and character of materials used in the plumbing field, and to bring about a more cordial relation between the jobber, the manufacturer and the trade in general. No attempt was made at the regulation of prices, as this question was not even touched upon during the meeting. The new association also aims to introduce a higher



C. V. Kellogg, Chicago.

standard of business methods, which will make for a better understanding between buyer and seller. During the early session of the new organization telegrams were received from jobbers in every part of the country applying for membership. The following officers were elected to serve the new organization: President, C. V. Kellogg, of the Kellogg-Mackay Co., Chicago; 1st vice-president, Frank A. Buckman, of the Nason Mfg. Co., New York City; 2nd vice-president, H. W. Thorndike, of the F. W. Webb Mfg. Co., Boston; treasurer, J. Harvey Borton, of the Haines, Jones & Cadbury Co., Philadelphia; secretary, Thos. A. Fernley, Philadelphia; advising secretary, T. James Fernley, Philadelphia; executive committee: Wm. Schlipp Jr., of the Central Metal & Supply Co., Baltimore; A. A. Merkel, of the Merkel Bros., Cincinnati; A. A. Pierce, of the N. O. Nelson Mfg. Co., St. Louis; Geo. H. Bailey, of the Bailey-Farrell Mfg. Co., Pittsburg; Chas. W. Frean, of the John Simmon Co., New York City; and J. L. Sullwold, of the Western Supply Co., St. Paul, Minn.

LARGE RADIATOR CONCERNS CONSOLIDATE.

A new corporation, which will be known under the name of the United States Radiator Co., is being organized at the present time with a capital stock of $8,000,000, for the purpose of taking over the businesses and plants of the following well-known concerns: The United States Heater Co., Detroit; The United States Radiator Co., Dunkirk, N. Y.; The United States Radiator & Boiler Co., Pittsburg, and the Herendeen Mfg. Co., Geneva, N. Y. It is expected that the actual transfer of property to the new corporation will take place on or before June 1, 1910. The general offices of the new company will be located at Buffalo, N. Y., and among its officers will be the following: President, R. J. Gross, of Dunkirk, N. Y.; vice-president, H. P. Cole, Detroit; secretary, G. C. Blackmore, Pittsburg.

SUPPLY ASSOCIATION TO MEET IN TOLEDO, O.

The Eastern Supply Association and the Central Supply Association will hold their next joint convention at the Hotel Secor in Toledo, O., on June 14 and 15, 1910.

REGAR CO. FINISHES ITS NEW PLANT.

The Regar Co., 919 West Ave., N. W., Cleveland, O., has completed its new plant and expects to have it in full operation within 30 days.

PLANNING LARGE IMPROVEMENTS.

The National Tube Co. Pittsburgh, has been considering in a tentative way the matter of making some large improvements and additions to its Benwood Works at Benwood, W. Va. It is probable that a decision will be reached in the near future.

WILL MAKE PLUMBING SPECIALTIES.

The F. Sutherland Co., New York City, has been incorporated with a capital of $5,000 to manufacture plumbing specialties. The incorporators are: Fred Sutherland, 161 E. 54th St.; Dickinson E. Griffith, Nicholas E. Betjeman, 165 Broadway, all of New York City.

WILL MAKE TOOLS AND PLUMBING SPECIALTIES.

The Fry Mfg. Company has been incorporated at Syracuse, N. Y., for the purpose of manufacturing and dealing in plumbing tools and specialties; capital stock, $100,000. The incorporators are S. S. Newton, New York City; S. J. Cox, Cranford, N. J., and A. C. McDonnell, Bay Ridge, N. Y.

TWO CLEVELAND COMPANIES CONSOLIDATE.

The Ideal Filter & Mfg. Co. and the Peerless Ice Machine Co., who occupy adjoining plants in Collinwood, Cleveland, O., have consolidated under the name of the Ideal Peerless Mfg. Company. The new company will manufacture ice making machinery, filters, pumps, washers and liquid coolers.

NEED PLUMBING AND HEATING CATALOGS.

Anderson, Lore & Co., First and Myers Sts., Los Angeles, Cal., jobbers of oil-well, steam and plumbing supplies, are at present making a complete index to the catalogs on hand in the above lines and would like to receive additional trade literature from jobbers and manufacturers in the industrial branches represented by "Domestic Engineering."

PLANS LARGE FOUR-STORY BUILDING.

The Kennedy Co., Cleveland, O., has completed plans for the erection of a four-story building on Euclid avenue, near East 19th street in that city. The structure will have a frontage of 162 ft. on Euclid avenue and will reach 190 ft. back from the street, containing 110,000 sq. ft. of floor space, half of which will be occupied by the Kennedy company. It is planned to have the building ready for occupancy about January 1, 1911.

H. B. SMITH CO. MAKES LARGE IMPROVEMENTS.

The H. B. Smith Co., Westfield, Mass., manufacturer of heaters and radiators, has begun an extensive scheme of improvement of its works. The foundry at the North End plant is being extended by the erection of a building 48 x 80 ft., and a concrete core room is building at the South Side plant. The programme of rearrangement and extension will be carried out chiefly at the North End, and will include eventually a very large increase in producing capacity.

NOW WITH THE COMPOUND INJECTOR & SPECIALTY CO.

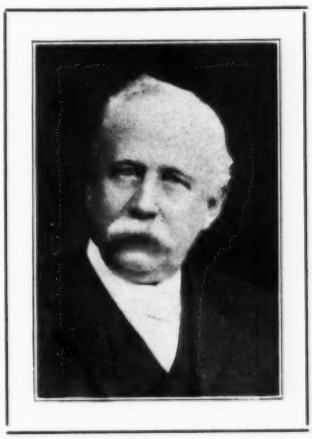
W. P. Murphy, special order-reaper for Dehn's sanitary specialties, manufactured by the Compound Injector & Specialty Co., Chicago, tore in to see us the other day, shook all the pen-chiefs by the hand and sat down for a meteoric second. Notwithstanding the laxative influence of the comet, he said injectors were still selling briskly, and left a scorch-streak all the way to the elevator. He either had one sex or the other to see and since it was a fine day—and noon, what's the answer?

THE DEATH OF W. C. HIGGINS.

We regret to record the death of W. C. Higgins, one of the best known characters in the heating trades of the country. He died on April 21st, at the residence of his son, Henry, in Brantford, Ont. Henry Higgins is manager of the plant of the American Radiator Co., at Brantford.

Mr. Higgins was born in Norwich, Conn., about 70 years ago and took an active part in the building up of the heating industry in the northeastern states, thereby laying the foundation for the work of the present time.

We show also herewith a group picture taken in 1896 of W. C. Higgins and his office staff when he was president of the Richmond Stove Co., Norwich, Conn. He held that position for over 20 years. This group will be of great interest to the heating engineers of the country, as the men who were with Mr. Higgins at that time are nearly all occupying permanent positions in the heating field today. We give herewith the names of these members of the group as indicated by the numbers: 2—J. W. Fryer, manager, American Radiator Co., Denver; 4—Chas. Hauss, manager, American Radiator Co., Hamburg, Germany; 6—Henry Higgins, manager American Radiator Co. Brantford, Ont., Canada; 8—Norman Whitelaw, American Radiator Co., New York; 9—Thos. J. Douglass, heating contractor, Chicago; 10—Frank Howell, manager, American Radiator Co., New York; 11—Frank Whitelaw, manager of Boiler department, American Radiator Co., Chicago; 12—John P. Galvin, now with Isaac Coffin Co., Boston; 15—the late W. C. Higgins; 16—the late A. J. Hannett, formerly secretary and treasurer of the Richmond Stove Co., Norwich, Conn.



The Late W. C. Higgins.

Interesting Group Picture, Taken in 1896, Showing Many Men Who Are Now Occupying Important Positions in the Heating Trade of the Country.

The Anti-Siphon Trap Question

Some Comments and Experiments

By Louis Friday, Schenectady, N. Y.

We do not exactly agree with the author of this article in every respect, but the record of his experiments with anti-siphon traps will no doubt be read with interest. His comments and conclusions must therefore be considered as the expression of his own personal views.—Editor.

I have taken great interest in the articles, by different writers, which have appeared in "Domestic Engineering" since its publication of "A Defense of Anti-Siphon Traps." The article referred to also contained a criticism of the Department of Health of San Francisco for opposing the use of anti-siphon traps in any form or of any trap having a tendency to interfere with the proper venting of plumbing fixtures.

I am interested because I have had considerable experience with different systems. Handicapped somewhat by the lack of information as to the form of ventilation that has been adopted in San Francisco, I will, nevertheless, endeavor to express my reasons for favoring the improved venting systems known as continuous or circuit-venting and for opposing the general use of anti-siphon traps. Such opposition I will maintain until these traps are constructed from better material and on more improved lines than at present.

I note that in the articles referred to, and also at the many conferences held, where the use of anti-siphon traps is recommended, that advocates of these traps always refer to the crown system of venting, and get as far away from the real issue, the continuous venting system, as possible. They might as well compare a pan closet with the most approved closet in use at the present time.

I herewith advance the following theories concerning anti-siphon traps for your consideration:

It is true that the anti-siphon traps are not put to as severe a test in practice or general use as that to which they are submitted by a testing apparatus in regard to their siphonic action.

It is also equally true that they will not stand such tests after they have been installed or in use after six months or more. It is a fact that defects will appear in anti-siphon traps that cannot be detected when installed, and in some cases not even by a smoke test. By the way, the smoke test is not always applied even when cities own such apparatus.

I contend that the defects of anti-siphon traps are obviated by the use of the continuous venting system, and my contention will be supported by the sketches accompanying this article.

During the last four years the writer has removed several defective anti-siphon traps. Dispensing with the vent pipes and making their work a part of the function of the main stacks to my mind is as dangerous as the action of a railroad operator some time ago. He was in charge of a signal tower and had strict orders to clear the road for a special train. He had 24 levers to choose from and at the right moment chose the wrong lever and wrecked the train. I consider the vent pipes as representing levers in my analogy, and the train as the anti-siphon trap. It is a violation of the rules of common sense to advocate the omission of all vent pipes because a trap will stand a certain test, when sent out by a manufacturer who may have carefully examined it. Should the trap not prove efficacious when installed, the discovery of its inefficiency by the plumbing inspector places the blame on the plumber who installed it, which is manifestly unfair.

A study of the illustrations will show how the vent pipes discharge the sewer air up through the vent stack, instead of allowing the foul air to enter the house.

In your issue of January 8th, the report of the sanitary committee of the National Association of Master Plumbers is quoted, the following excerpt being given: "I believe, however, that my result, in the light of our previous evidence, warrants the conclusion that the chance of practical bacterial infections through the air of drains and sewers is so slight as to be practically negligible."

It is stated that the air in the house drain and sewer contains many times less bacteria than the air in the open street. This may be true, but one breathes more fresh air in the street than in confined sleeping or living rooms, which in many cases are without perfect ventilation. The opinion also seems to be held that the disease-giving effect of sewer-air is overrated, and that a bad odor is the only evil to be remedied. The anti-siphon trap does not always perform the work of keeping out the odor.

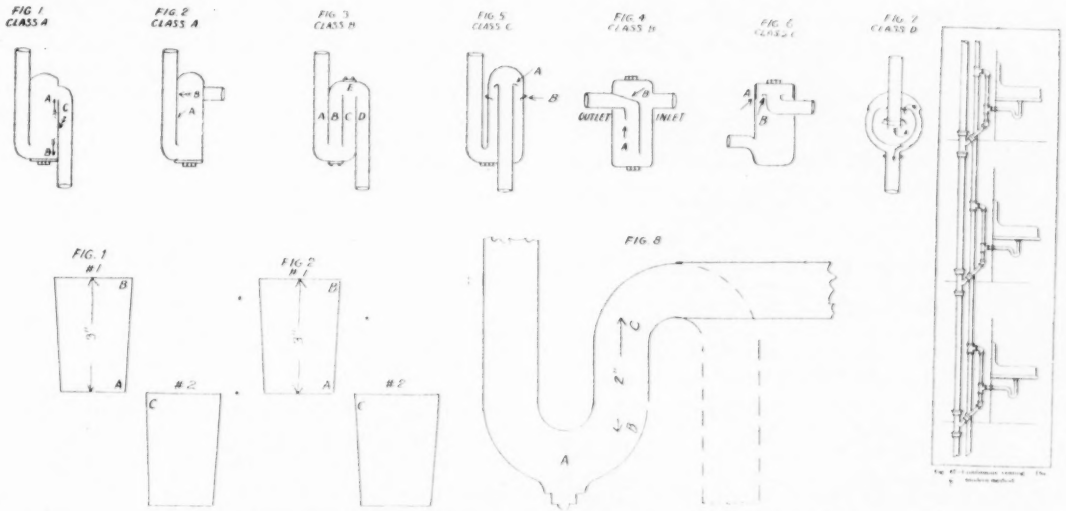
Referring to sewage bacteria, I recently attended a lecture by Prof. Kinnicutt of Worcester Polytechnic Institute, given at Schenectady, N. Y. He described the different methods of sewage removal and disposal, and gave special attention to the system in operation in the city of Berlin, Germany. He said that from this plant was given off a very bad odor, which could be detected for miles. Apparently it was not obnoxious to the population, as the Germans are used to strong odors. The officials in charge of this plant thought that it worked well and was a perfect success. The same argument might be advanced for the working of an anti-siphon trap. However, since the Germans (and the writer is one of them) have become Americanized, we want odorless plumbing, and the continuous venting systems will bring about the desired condition.

The city of Schenectady was, perhaps, the first to adopt the anti-siphon trap system, which was introduced by J. E. Harbison, Plumbing Inspector, in March, 1906. At that time I appeared before the Board of Health in opposition to the system and submitted several tests showing the inefficacy of the anti-siphon trap after continued use. I pointed out possible defects in partitions, blow-holes in the inner parts of both brass and lead traps, defects which could not be detected by the eye and in some cases not even by the application of a smoke test. I also exhibited an anti-siphon trap which was entirely choked up with slime and grease in one tube and partially so in the other. It, however, still acted as a waste, though slowly, and contained 1-3 less water for sealing purposes than it did when in perfect condition. I also placed before the health board five exhibits of siphonic action due to capillary attraction. Notwithstanding this evidence, the anti-siphon trap was adopted, and the defective trap

shown was also allowed to be used. The new code adopted at that time provided that a building four or more stories high must have a special vent-pipe to protect the anti-siphon traps used in the building from the first to the third floors. My demonstration convinced the board that these traps were in danger of being siphoned. They left me, so to speak, on the fourth floor, that is on the roof, as 99 per cent of the buildings at that time were less than four stories high. Notwithstanding, I am still on the ground floor with more convincing arguments than ever.

Following this defeat, I immediately put up a trap plant at my own expense for experimental purposes. It was placed at the disposal of the Board of Health and the plumbing inspector, who could use it free of charge. I made several tests for manufacturers and have removed from several fixtures since we adopted this system in June, 1906, several defective traps, which had been in use from six months to four years.

It will be interesting at this time to consider the five different types of anti-siphon traps, which vary only at



Types of Anti-Siphon Traps, Tested by Louis Friday, Schenectady, N. Y.

some point of construction, and are manufactured of cast-lead or cast-brass for the most part, although in a few cases brass tubing is used.

Class A shows a type of trap in which the inlet and outlet are connected to the body of the trap proper by direct wall connections, i. e., three bodies connected together with partition of outside walls.

Class B shows a trap having partition and walls inside of the body of the trap.

Class C is named sometimes "Mushroom" type. In this the tube expands at the top of the stand-pipe. In this tube the stand-pipe is of cast-brass or of brass tubing.

In class D the tubes shield balls or other mechanical devices used to seal or reseal traps when siphonic action takes place.

Referring to class A or Fig. 1, this trap is made of cast-lead or cast-brass. It is a well-known fact that blow-holes will appear on the outside or inside of traps, and that the manufacturers have not been able to overcome this defect. This frequent occurrence of blow-holes is due to the use in brass traps of metal of a poorer quality than that used in stop-cock or valve construction. The writer has noted that in one make of trap not more than 10 per cent of the whole output is free from blow-holes. The lead in this trap is ⅛ of an inch thick, and the trap bears a label testifying to the fact that it has been tested under 20-lb. pressure. Now if a blow-hole appears in the inner wall C of Fig. 1, at any point between A and D, the trap would have no seal at all, or it would reduce the seal in depth to the blow-hole from point B. The 1¼-in. trap has a seal 1⅝ in. deep, and the 1½-in. trap has a 2-in. seal. This last trap was tested at my plant, the testing not being as severe as in some cases, and they siphoned off 1⅝ in. under two discharges of 10 seconds each, leaving seal only ⅜ in. in depth. With the 1¼-in. trap, the seal was broken. The plumbing code provides for a seal 2 in. in depth. This is right, and yet the 1¼-in. trap is still allowed to go in.

In Fig. 2, class A, the same type of trap is shown in P-form. I have on exhibit a trap of this kind which was about to be installed by the workman, when he discovered a blow-hole ⅛ in. in diameter at the point B or wall A by accidentally looking in the outlet of the trap. Now suppose this was an S-trap, as shown in Fig. 1, class A. He would not have been able to discover this defect. This would more likely be the case in repair work. In such cases sewer-air would pass at all times into the house and still the trap would have a seal which would not be broken, the hole acting as a vent pipe and receiving air at the inlet.

In Fig. 3, class B, another form with inner walls or tubes, marked A, B, C and D, is shown. This 1¼-in. trap was removed from a lavatory, complaint having been made that it always ran over slowly, and emitted very bad odors. Upon removal it was cut in two sections and we were surprised to find that tube B was closed up entirely from top to bottom; also the air chamber above the tubes, except a small chamber at the top of tubes C and D. The efficiency of this trap was destroyed as it depended on two tubes, B and C, and air-space, E, for the proper performance of its function as an anti-siphon trap. This was exhibited by me before the Board of Health, but was adopted providing that the trap screw should be soldered on the top, as the code provides that all covers must be submerged. In this case the trap was choked up, and still acted as a waste without having its defect detected. The test applied to this style of 1½-in. trap which has a seal 4¾ in. deep and holds 15 oz. of water, resulted

in the siphoning of 4½ in. of water under two discharges of 10 seconds. This left a seal only ¼ in. in depth. If blow-holes should appear in the inner walls or outer walls of this trap connected to the outlet of the trap, the same results would be obtained as in Fig. 1, class A.

Now, let us examine Figure 4, class B. This trap is provided with a lip, A, a deflecting shield, and an inner partition D extending nearly to the bottom of the trap. The construction of the trap makes it possible to install this in a reversed position without being detected by the plumbing inspector. One such case I have in mind, which had been passed by him. This is not meant to criticise him in any way, as he cannot be asked to remove every cover for inspection, and it could not be discovered by applying a smoke test. It is easily possible for any plumber not familiar with the trap to reverse it in its installation. The manufacturer, in his instructions, states that when properly installed, and the water from the bath, sink, or other source is allowed to flow through the trap, the discharge pipe will form a siphon. The atmosphere will depress the water on the inlet side of the vertical position and will raise the water on the outlet side until air can pass under the lower edge of the partition, and thence to outlet to break the siphon, owing to the plate with its depending pipe. In this trap the action depends upon the passage of the air and water between lip and partition, and around the corner over the edge of the plate, and a practically perfect seal can only be insured by the trap's proper installation. So long as such traps are placed on the market, so long will there be mechanics who install these traps the reversed way, beyond the notice of the plumbing inspectors.

Let us further suppose that this trap, which was installed correctly, should stop up in part A. If a tenant or owner removes the trap cover so as to get at the seat of trouble, which is so often done to save an hour's plumbing bill, he will find space B clear and proceed to cut a hole in the deflecting shield B. Not realizing that he is doing any damage, he removes the stoppage of A, puts back the cover, and smiles in a satisfied manner, because he thinks he has saved a plumber's bill. In reality he has destroyed the essential part of a trap whose function is to keep the sewer air from the room. Sewer air is thus allowed to pass, when the cover is removed or the washer not replaced, through the deflector into the house at all times. Let us now consider the inside of Fig. 5, class C. This type of trap will stand a good test, and is built along sanitary lines. It is in fact better than any other shown in my article, but it has a good many weak points. I recently made a test of this trap where it was installed under a kitchen sink. The trap is constructed of lead with a brass dome which unscrews from the body of the trap about 1 in. below stand-pipe A. This pipe leaked at B when installed, but by the next morning the leak had ceased to manifest itself, so the trap was let alone. Six months after the trouble again appeared at the same point. Upon examination it was found that in the lower part of the trap, which is of cast-lead with brass ring threaded so as to receive the brass-dome cover, the brass ring was separated from the cast-lead body which had been shrunk on, or in which the lead had been expanded to the brass ring by a special tool. The expansion and contraction due to the running of hot and cold water through the trap had separated these two parts. The trap was removed and brought to the shop and on taking off the bottom cover we were amazed to find lint and hair combined, weighing two ounces, the mass being 9 in. in length and ½ in. in depth. Part of this hung in the body of the trap and part in the stand-pipe or outlet. This caused a siphonic action due to capillary attraction. This is very dangerous, especially if the stand-pipe A which is of brass tubing should split. In the event of overflow of water-closets with such split tubing, no seal could be maintained in the trap.

In Fig. 6, class C, we have a trap made of cast-brass. This trap was installed in a residence, and when the water test was made, the body of the trap leaked in several places, due to sand or blow-holes. Some of these holes could be reparied with the trap in position. Close examination showed blow-holes in the outlet tube, B. This would not have been discovered if the body of the trap had been alright. The trap was removed and the blow-holes could be repaired with the trap in position. Close plumber as it was close work, and the sink and lavatory wastes had to be removed to get at the defects.

By referring to Fig. 7, class D, you will note an anti-siphon trap which is installed in an architect's office in this city. The trap is made of heavy brass, drawn metal. The inside of the trap is as smooth as the outside, and therefore offers no lodging place for collection of foul matters. So says the manufacturer in his pamphlet. I was called to examine this trap because the assistant treasurer of the city of Schenectady had dropped his gold ring into the basin of the trap. I removed the trap and took it apart, and I assure you we found nothing but the gold ring and filth. The missing link was water. The gold ring could not have pulled through the filth if a small boy had had a string attached to the ring and had tried to pull it through.

Now speaking of traps used in continuous venting, it is not necessary for me to take up space with cuts or explanation. The only opposition that has been advanced against long vent lines is the cost. Traps cannot be siphoned with such a system when set not more than three feet from the main stacks.

Speaking of siphonic action due to capillary attraction as noted in the cases of the S trap and Mushroom trap, shown in Figs. 5 and 6, class "C," due to the sharp angles and rough edges to which lint and hair will cling, I will describe some experiments made by me on this subject.

Figs. 1 and 2 represent an ordinary glass 3 in. high. I used a strip of cotton to represent lint. This was ½ in. wide and 7 in. long. The glass in Fig. 1, No. 1, was filled with water, and the strip of cloth submerged from point A to B. The balance of the cloth, 4 in. in length, formed a siphoning leg extending 1 in. below the bottom of the glass, into glass No. 2, 3 oz. of water siphoned out of glass No. 1 into Glass No. 2 in six hours.

In Fig. 2, the same test was made, the conditions being the same only hair was used in place of cloth. In this case six ounces of water were siphoned out in six hours. The hair mass was about ½ in. in diameter, and 7 in. long.

In reference to evaporation of traps to which defenders of anti-siphon traps refer as a cause of loss of seal, I call your attention to Fig. 8. This trap is of a style generally used for continuous vent work and also for old-fashioned crown venting, except that the vent is taken directly from the crown of the trap over the seal. I made a test as to evaporation of the 1¼ in. lead trap with a 2-in. seal containing 5 oz. of water, which require 1¼ oz. of water to maintain the seal of this trap with the crown vent. It was exposed to the sun during the month of July, for 144 hours or six days. The thermometer reached as high as 110 deg. F., and the trap had the inlet, outlet and vent-coupling exposed to the air. Under

these conditions the water of this trap evaporated 8 drams in 144 hours. It would therefore require three weeks or more to break the seal. Such extreme conditions do not apply in general use, and the evaporation theory does not receive any support from such experiment. If you will refer to Fig. 2, No. 1, you will find greater danger from siphonic action due to capillary attraction than from the breaking of the seal in the trap by evaporation.

Fig. 8 shows a P-trap used for continuous venting. The S-trap is shown by dotted lines and may be used, but the former is preferred. You will note the inlet and outlet walls or tubes have no connection with each other directly. This avoids all danger due to unobserved blow-holes, leaks or defects of manufacture, and the long curves and smooth bore makes it self-scouring in practice. Capillary attraction is impossible when the P-trap is used, even if matches or tooth-picks should find their way to point A, and accumulate lint or hair. Clear floor-space under fixture is another advantage with the P-trap, as can be seen in Fig. 9.

I fail to see where simplified plumbing is of any advantage at the present time, either to the public or to the plumber, since the blame for defective installation is put on the master plumber and he has to pay all expense for changes necessitated by defects discovered in installation. I assure you that when the manufacturer of so-called anti-siphon traps eliminates the defects as I have found them and have pointed out in this article, we will be glad to fall in line with simplified plumbing. The National Association of Master Plumbers has gone to great expense in making scientific investigations concerning sewer-air and sewage bacteria. I would recommend that a committee be appointed by the American Society of Inspectors of Plumbing and Sanitary Engineers and a similar committee by the National Association of Master Plumbers at their next convention, held in Chicago, for the purpose of making tests for traps and the detailed examination of actual conditions as found in practice. It will thus be possible to work out plans as to the best form of plumbing to be installed or recommended. This should appeal to everybody. The duty of the plumbing inspector is to see that the plumbing code is lived up to. The manufacturer of defective goods should be charged with the expense, at present borne by the master plumbers, due to such defection. The plumber under the present strenuous supervision of the different health departments, not only bears the expense, but is charged with the entire blame through the press, suffering the loss of trade, and is set down by the public as a "monster skin."

ATTRACTIVE PROGRAM FOR ENTERTAINMENT OF PLUMBERS AT NATIONAL CONVENTION IN CHICAGO BEING PREPARED.

The arrangement committee in charge of the entertainment features of the 28th annual convention of the National Association of Master Plumbers, which is to be held in Chicago June 28, 29 and 30, 1910, is busy these days with elaborate preparations for the entertainment of the delegates, their friends and ladies who will attend this convention. The committee expects to have 3,000 visitors in attendance and it plans to entertain every one of them every waking moment they spend in the city. The committee meets once a week to devise ways and means to accomplish the task in hand, and it has appointed several sub-committees to look after the details of the arrangements. Chas. J. Herbert, chairman of the committee, is both busy and enthusiastic, and he aims to make the convention the most successful and enjoyable in the history of the association.

DATES FIXED FOR CONVENTION IN SALT LAKE CITY.

The thirteenth annual convention of the Colorado Master Plumbers' Association, comprising the states of Colorado, New Mexico, Utah and Wyoming, will be held in Salt Lake City, Utah, on Monday and Tuesday, May 30th and 31st. Special rates have been granted on all lines running into Salt Lake and there will undoubtedly be a large attendance of delegates with their ladies. Information from Salt Lake to President Chris Irving of Denver states that Chas. J. Higson, of Higson & Rossitter, Salt Lake City, and Vice-President for the State of Utah, has been selected chairman of the entertainment committee. The

The THIRTEENTH
Annual Convention
of the Colorado Master Plumbers' Association
WILL BE HELD IN
SALT LAKE CITY, UTAH, on Monday and Tuesday, May 30 and 31, 1910
COME BACK AND FIX THAT LEAK
NOT WHILE THAT CONVENTION IS ON IN SALT LAKE CITY
THE Salt Lake Master Plumbers cordially invite you to be present and accept of their hospitality
Please return enclosed Postal Card properly filled out, at once
COMMITTEE

Reduction of Poster Issued by Denver Master Plumbers' "Salt Lake Club."

Denver local association has appointed a committee consisting of Peter E. Snow, chairman, James T. Eagan and A. S. Hubbell, to form a "Salt Lake Club" and make arrangements for the trip to the Mormon city for the Denver delegates. The convention will be in session two days and important business is to be considered.

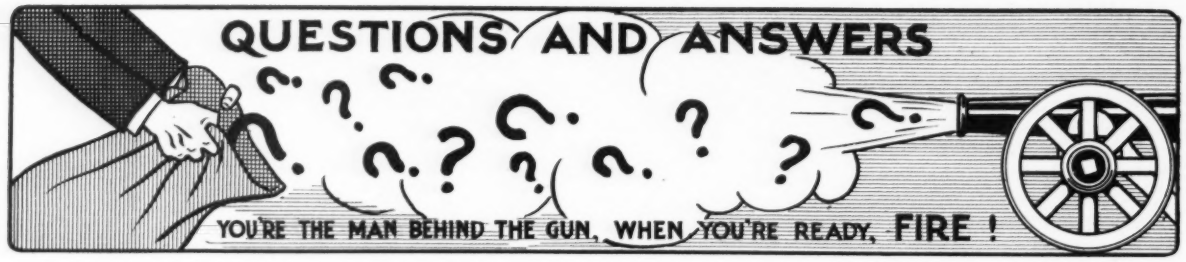
CONNECTICUT PLUMBERS TO MEET AT HARTFORD.

The Master Plumbers' Association of Connecticut will hold its 20th annual meeting in Hartford, Conn., on Wednesday, May 11. The Hotel Garde has been selected as the headquarters of the convention and the business sessions will be held at the Putnam Phalanx Armory, Pearl and Haynes street. Secretary G. R. Hempstead of New London, expects that this convention will be the largest the association has had for several years.

WANT NEW BIDS ON OMAHA COURTHOUSE PLUMBING AND HEATING.

Architect John Latenser of Omaha, Neb., has submitted new plans for plumbing and heating of Omaha's new court house to the county commissioners, which may save from $10,000 to $20,000. Bids on the modified plans have been asked by the board for return May 14. Elimination of "frills" in heating and plumbing equipment from former plans may make it possible to complete the court house within the $1,000,000 in bonds voted.

The St. Cloud Plumbing and Heating Co., St. Cloud, Minn., has been awarded the contract for the installation of the heating plant in the new Gordon & Ferguson Glove Factory, Granite City, Minn.



FLAG-POLE MADE OF IRON PIPE.

Editor "Domestic Engineering": Referring to the inquiry in a recent issue of your valuable journal asking for particulars regarding the construction of an iron flag-pole, I take pleasure in sending you herewith a sketch of a flag-pole of wrought-iron pipe, manufactured by the Walworth

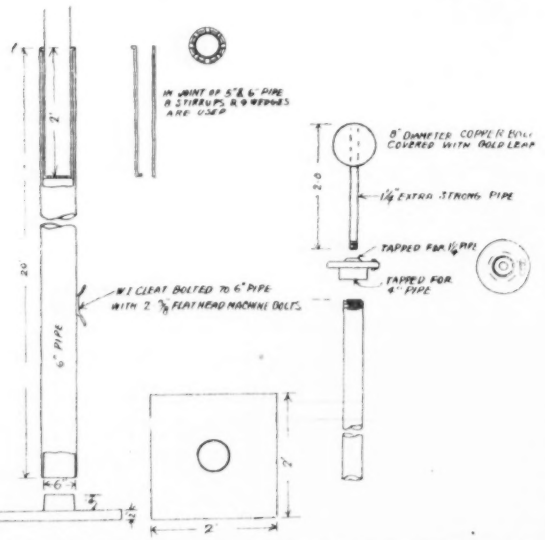


Fig. 1. Showing Construction of the Walworth Iron-Pipe Flag-Pole.

Mfg. Co. of Boston. The illustration (Fig. 1), with its annotations, will give "Irondequoit" a clear idea of how this pole is connected up.

Trusting that this sketch may prove of service to your inquirer and other readers of your paper, I am,

Yours truly,

New York, N. Y. Edmund B. Keane.

REGARDING MEASUREMENTS.

Editor "Domestic Engineering": Will you kindly tell me through the columns of your paper how many measurements (on heating or plumbing job) a man should be capable of taking at a time and having them come out correctly?

San Francisco, Cal. An Apprentice.

Circumstances differ and in some places a man would have to take a greater number than others. We should consider, though, speaking on a fair average, that a man should be able to take at least six measurements at one time and cut them up at the bench before he put them in. Sometimes it is possible to measure up the whole job and cut the pipe before it is strung. These are matters which require experience and practice and on top of that one should exercise at all times good practical common sense, without which the best fitter or plumber will get tangled up pretty badly at times.

THE AVERAGE LENGTH OF A WIPED JOINT.

Editor "Domestic Engineering": Will you kindly tell me the average length of the average wiped joint and oblige.

Syracuse, N. Y. Beginner.

It is different in various parts of the country. From two to three inches, although we believe that most of the plumbers prefer a joint about two and one-half inches.

PLUMBING CURIOSITIES IN COLORADO.

Editor "Domestic Engineering":—Thinking that it might interest you and some of the readers of your excellent journal I send you herewith a photograph (Fig. 2.) of two exhibits, which I have recently added to my collection

Fig. 2. Plumbing Curiosities in Colorado.

of plumbing curiosities. One is a wiped joint on a soldered nipple cut away by water while it did service several feet below the surface of a filled street. The other is a joint on or leading from a basin trap. This joint was perfect in front, but in the back it was joined so poorly that a man could stick a finger through it. Had the plumber, who did this job, joined the ends together tight without using any solder, it would have been far better. I confess that I could never have wiped such a joint, and yet the man, who paid for this work, assured me,

that it was done by a good plumber. Having been bothered by bad odors in his bath-room he recently decided to have an entirely new outfit installed and called on me to do the job. I have now installed an up-to-date bath-room, which has done away entirely with bad odors much to the satisfaction of the owner and his family.

Pueblo, Col. Chas. Geiser.

AUGUSTA STEAM JOB MADE RIGHT.

Editor, "Domestic Engineering": I am inclosing herewith a blue print of "An Unsatisfactory Steam Plant, Made Right," which you made drawing and explanation of in a recent issue. I hope that it will be of some service to you, as well as to the Augusta man.

You will notice the changes which I have made from the rough sketch, which I believe are plain enough not to need explanation. I have arranged a little different placing of the radiation. This will make the job a little more efficient, but, of course, conditions might not allow this, however, the radiation could be placed as shown on the sketch, with but little change in the piping plan.

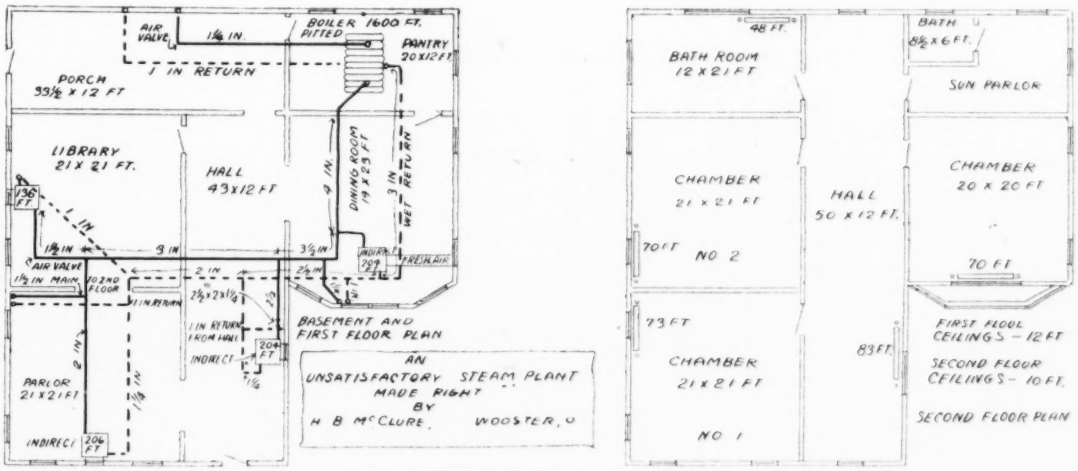


Fig. 3. The Augusta Steam Job Made Right.

The boiler I use is a 1,600 ft. boiler and should be pitted as low as possible. It might be necessary in the long run of main, to rise and bleed, owing to the cramped condition of the cellar. The steam will supply (according to my figures) in a satisfactory way, all radiation, under 2 lb. pressure. You will notice, I have put in windows and doors at different places, as there were no openings shown on the sketch, these will of course not be correct, but I believe my ratings will be approximately accurate. The ratings for all first floor rooms is 0 deg. outside and 70 deg. inside, Bath-room 0 plus 80, Chambers 0 plus 65, if any variation either way is wished, add or deduct 1 per cent, per degree.

The job as it is, is probably air-bound, this would enable them to get the pressure spoken of.

Wooster, O. H. B. McClure.

THE HEIGHT OF THE KITCHEN SINK.

Editor "Domestic Engineering": I am glad to see the remarks by "C. N. W." in your "Questions and Answers" in the issue of April 16.

For years plumbers have made it a rule to place the kitchen sink at a height of about 30 inches. Now, this for an exceedingly short person is about the proper height, but when the party who uses the sink happens to be from 5 ft. 7 in. to 5 ft. 10 in. tall it is extremely inconvenient.

Whenever setting sinks for people of that height I have always placed the sink at least six inches higher than the general practice and have been thanked many times for my foresight by appreciative housewives. I have always tried to get my sinks under or near a window whenever possible, believing that the housewife should have as much light and air on her work as it is possible to get.

Trusting you may see fit to publish these few remarks, I remain,

New Orleans, La. Subscriber.

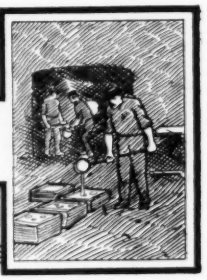
NOT A NEW DISCOVERY.

Editor "Domestic Engineering": The principle of heating by hot water from a steam-boiler, as described by "Phoenix" in "Domestic Engineering" of April 16th, is very ancient. It has been in use in scores of houses in Chicago and the West over 40 years. It was originated by R. T. Crane, and illustrated in a pamphlet by R. T. Crane & Bro., about 1865, also by Hay & Prentice in 1878. There is no better system of heating a house in use to-day than a combination of steam and hot water from a steam boiler with indirect radiation. The writer has such an apparatus in his own home that has been in use 25 years. Yours truly,

Chicago. Leon H. Prentice.

Editor "Domestic Engineering": In reply to the letter from L. H. Prentice which you sent me I would state that the job referred to was put in about fifteen or more years ago and has worked well ever since. I did not intend to convey the idea that this was a new discovery but rather to put the information where it would do some good. Mr. Prentice should remember that among the 10,000 readers of your paper there are many who have never seen a job of this kind. I notice that you receive letters constantly regarding combination jobs both in heating and plumbing. The tendency of the average plumber or fitter is to hold on to any ideas he may have. It was for the benefit of such of your readers who have never seen a job of this kind and to help break up the selfish tendency to withhold information that the article was written. Phoenix.

THE METAL MARKET



FURTHER WEAKNESS IN PIG IRON.

The curtailment of the production is now regarded as the only thing that will give stability to the pig iron markets. Prices continue to drop in spite of the blowing out of furnaces and the curtailment of coke production. The Frick Coke Co. has put out 1,200 ovens and other producers are likewise restricting output. Nothing definite is known regarding the rumor of the 25,000 ton purchase of Southern foundry iron by the leading pipe manufacturer, and sale has undoubtedly not been made for there is no stability to the market which would probably be the cause should such a large purchase by an influential buyer be consumated. It is evident, however, that a lower price than $12 could now be quoted. In the Chicago district, Southern foundry No. 2 has again declined 25 cents per ton. The weakness during the last week has really been more apparent in steel-making irons than in strictly foundry stock. Prices are as follows:

No. 2 Southern foundry, Birmingham	$12.00 to $12.50
No. 1 Virginia foundry, New York	18.00 to 18.25
No. 2 X Northern foundry, New York	17.50 to 17.75
No. 2 Plain Northern foundry, New York	17.25 to 17.50
No. 2 Northern foundry, Chicago	16.35 to 16.85

THE COPPER PRODUCER'S ASSOCIATION.

The chief news of the week has been concerning the Copper Producer's Association. An early rumor being that reports heretofore given regarding the production of stock and deliveries of consumption in copper would be discontinued. This was talked of for a day, severely condemned and then officially denied by the association members. By some, it is regarded as a strategic move on the part of the association to test the feeling regarding these figures and had there been no clamor against their publication, the association would probably have dissolved. As it was, the clamor was so great that the association will continue to publish its figures. No accurate value can be placed on the figures yet, but it is believed they are honestly compiled and published in good faith.

Sales of Lake copper have been made at $13.25 and electrolytic is selling at $12.75. Domestic consumers have been reluctant to buy in quantities, but large consumers in Europe are buying considerably more freely.

LEAD.

Business is quiet but perhaps the real reason is that construction work where large quantities of lead is used, has not advanced to the point where this metal is desired. Prices seem to ease off from week to week and outside brands can now be had at $4.25 St. Louis and $4.40 New York. The American Smelting & Refining Co. continues to quote shipment lead, in 50 ton lots, at $4.50 per 100 lb.

SPELTER.

The market is extremely quiet. Little or no new business has developed and prices have neither advanced nor declined. Sales have been made in New York at $5.60 per 100 lb.

PIG TIN.

Consumers are strangely absent from the market. Business of consumers is apparently fair but they do not buy any raw material. Prices advance one day and decline the next. Sales are now being made at $33.25. to $33.30. The Arrivals of tin are large, amounting to 3,600 tons the first 20 days of April and there are afloat for American ports, 1,335 tons.

NEW YORK METAL MARKET, APRIL 27.

Copper, Prime lake	$13.00 to $13.30
Copper, Electrolytic	12.75 to 12.85
Lead	4.40
Spelter	5.55
Antimony, Cookson's	8.35
Straits Tin	33.15

NEW YORK OLD METAL MARKET, APRIL 27.

Dealer's buying prices are as follows:

Heavy Crucible Copper	$11.50 to $12.00
Plumbers' cocks and faucets	9.00 to 9.25
Heavy brass	8.00 to 8.12½
Light brass	6.25 to 6.37½
Heavy lead	3.75 to 4.00
Tea lead	3.50 to 3.75
Solder joints	6.25 to 6.50

THE OLD IRON MARKET.

Scrap continues to accumulate and prices show a saggy tendency. The market appears to be extremely discouraging. Prices for New York City delivery are as follows:

No. 1 yard wrought, long	$14.50 to $15.00
No. 1 yard wrought, short	14.00 to 14.50
Machinery cast	14.00 to 14.50
Wrought pipes and tubes	13.50 to 14.00
Wrought turnings	10.50 to 11.00
Cast borings	8.50 to 9.00
Stove plate	11.00 to 11.50

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury Department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m., May 20, 1910, for the construction, complete, including plumbing, heating, gas-piping and electric wiring, of the U. S. postoffice at Kokomo, Ind.

Until 3 p. m., May 23, 1910, for the construction, including plumbing heating, gas-piping and electric wiring, of the U. S. postoffice at Delaware, O.

Until 3 p. m., May 26, 1910, for the construction, including plumbing, gas-piping, heating and electric wiring, of the U. S. postoffice at North Yakima, Wash.

Until 3 p. m., June 6, 1910, for the extension and remodeling, including plumbing, gas-piping, heating and electric wiring, of the U. S. postoffice at Fremont, Neb.

All proposals should be in accord with drawings and specifications, copies of which can be obtained from the custodians of the above postoffices or from the office of the Supervising Architect at Washington, D. C.

George F. Chambers and Clif C. Holbrook, under the firm name of Chambers & Holbrook, have opened up a shop to do plumbing, heating and gas-fitting at 1322 Broadway, Denver, Colo. The firm has taken out membership in the Denver Master Plumbers' association. Mr. Chambers was but a short time ago engaged in the plumbing business in Watertown, New York, but was compelled to seek the higher altitude of Colorado for the health of his family.

CONTRACTS AWARDED.

The Bailey-Peppard Co., Des Moines, Ia., has secured the contract for the plumbing and heating in the Hawkeye Bldg. Consideration $4,200.

Watson & Crozer, Muscatine, Ia., have been awarded the contract for the plumbing in the Commercial Club's new building in that city. A high-grade line of shower-baths is included in the contract.

Charles Hahn, Lewiston, Idaho, has secured the contract for the plumbing and heating of the new school building in that city.

Edward Kanney, 612-614 Monroe St., La Porte, Ind., has secured the contracts for plumbing in the 20 Rumely houses which are now being erected in that city.

R. O. Carlin, 816 George Ave., Chattanooga, Tenn., has been awarded the contract for plumbing and heating the postoffice building at St. Elmo, Tenn. Consideration $1,797.

The Dakota Plumbing & Heating Co., Grand Forks, N. D., has been awarded the contract for plumbing the new Roosevelt school in that city. The consideration is $2,358.

George S. O'Neil, Paterson, N. J., has been awarded the contract for the installation of the plumbing and heating systems in the large apartment house to be erected by Issac Wruble, Ward and Clark Sts. Consideration $12,253.

The Fort Dodge Plumbing & Heating Co., Fort Dodge, Ia., has secured the contract for the plumbing in the new school building at Rockwell City, Ia.

C. H. Wertz, Lincoln, Neb., has been awarded the contract for the installation of the plumbing and heating systems in the new addition to the postoffice at Beatrice, Neb.

Clark & Jones, Lima, O., have been awarded the contract for the heating of a new Lincoln School at Coshocton, O. Consideration $2,207.85.

C. A. Brode, Coshocton, O., has secured the contract for the plumbing of the Lincoln School building of that city. Consideration $2,278.

The St. Cloud Plumbing and Heating Co., St. Cloud, Minn., has secured the contract for the plumbing in the new Gordon-Ferguson building in that city.

GOOD JOKE ON REGULATOR COMPANY.

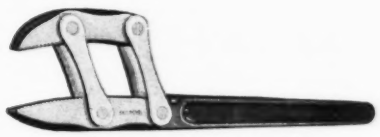
The Electric Heat Regulator Co., Minneapolis, Minn., is having a good joke played on it just now. The company manufactures automatic regulators for hot-air furnaces, steam and hot-water heaters, gas and steam valves, etc. Of course, it would seem that a manufacturer of automatic regulators would be able to regulate anything. The Electric Heat Regulator Co. has been having a hard time regulating its business output. Since 1885 the company has been established a careful regulation has been made of business increase from year to year. During the last two years, however, the growing business is keeping the company guessing. On January 1, 1910, S. Doyle a 12-year right-field with the company, had to be sent post-haste to open up a branch-office at 1849 Euclid Ave., Cleveland, O.

Benj. E. Atherton, 13 years with the Electric hitters, is going to be placed in the left field on May 1st, with offices at 1211-13 Harney St., Omaha, Neb. Here a complete stock of goods will be carried to supply the large retail and jobbing trade of that territory.

And still the joke continues, for the sales force has had to be increased and machinery has been added to the factory. The company foresees already a branch office in Kansas City and a distributing office in New York City to co-operate with its office in Syracuse, N. Y. We are waiting for this joker to come down our street. We are going to quit discarding jokers from the deck.

THE "SUPERIOR" PIPE WRESTLER.

The chief art in successful wrestling is to know the various holds and to so apply them with the proper amount of leverage at the right time in the right place that something is going to move. The Superior Wrench Co., Marshalltown, Ia., is located in the state of the famous world-wrestler and master-of-holds—Gotch. It is natural, therefore, with such a successful exemplar that when the company started to design a wrench which would get a strangle-hold on pipe, nuts and bolts, that the result would embody many features of merit. The company claims that



The Lake Superior Wrench.

its "Lake Superior Wrench" will put a half-nelson on the most stubborn pipe-fitting and put its shoulders on the mat in the twinkling of an eye. That is good wrestling. You can learn all the other things that it can do by writing for literature concerning the wrench, of which it is said: "The harder it pulls, the tighter it grips."

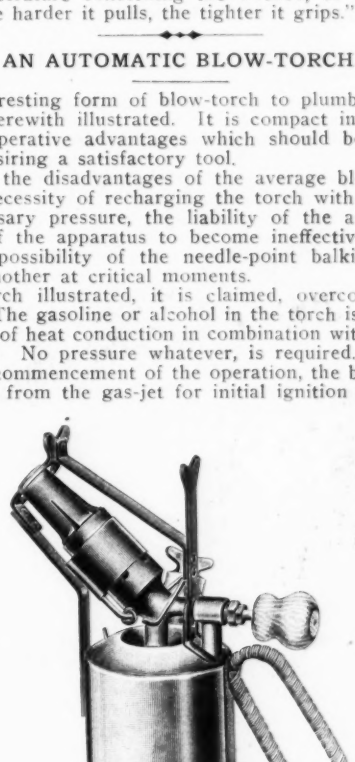
AN AUTOMATIC BLOW-TORCH.

An interesting form of blow-torch to plumbers should be that herewith illustrated. It is compact in form and possess operative advantages which should be apparent to one desiring a satisfactory tool.

Among the disadvantages of the average blow-torches are the necessity of recharging the torch with air to get the necessary pressure, the liability of the air-pumping portion of the apparatus to become ineffective, and the constant possibility of the needle-point balking in one way or another at critical moments.

The torch illustrated, it is claimed, overcomes these defects. The gasoline or alcohol in the torch is vaporized by means of heat conduction in combination with capillary attraction. No pressure whatever, is required.

At the commencement of the operation, the burner may be heated from the gas-jet for initial ignition or the de-



An Automatic Blow-Torch.

pression at the top of the torch may be filled with gasoline or alcohol and the gas generated in the same way as is common to the operation of gasoline stoves.

The torch can be operated in any position, upright, on its side or upside down, and still work with equal efficiency and without danger of gasoline overflow.

The flame can be regulated to suit the size of work as required, and when connections are being prepared the flame can be turned down so that it does not blow and holds a pilot-light back to the needle, which keeps the burner sufficiently heated to proceed with the work by simply opening the valve.

The fact that the torch requires no further attention to keep it burning after it is once lighted and that is can be used in any position with perfect satisfaction makes it a most desirable addition to the mechanics' field of automatic invention.

When working in the open air with a high wind, the proper regulation of the supply of air is obtained by means of a loose collar on the outside of the burner. The adjusting of this secures a blue flame under all conditions.

An occasional cleaning of the burner is all that is necessary to keep it in good condition. The torch is provided with a safety device which prevents explosion in case of over-heating. This blow-torch is said to save its cost in a short time because of the facility with which soldering operations can be conducted under the most disadvantageous circumstances.

The automatic torch has been in practical use for several years before being manufactured for the general market.

The manufacturers will be pleased to get in touch with responsible parties who may be interested in placing this torch in the trade. Full information may be had by addressing Editor, "Domestic Engineering."

A REAL LIVE WRENCH.

The accompanying illustration shows an ingenious advertising idea of the Walworth Mfg. Co., Boston, Mass. A live demonstration was given at the convention of the New England Hardware Dealers' Association in Boston, March 22-24. The animation for the frame was furnished

A Live Wrench.

by Ulysses Young, who looks every bit as imposing as his predecessor, the Grecian Ulysses. Mythology has not informed us what peculiar brand of baking powder the original Ulysses advertised, but we know that Mr. Young outulyssesed him at every point. Everybody gazed on the "genuine Stillson" wrench and marveled.

George Kreager has been appointed plumbing inspector at Duluth, Minn., to succeed Chas. Rigdon, who had held the position for seven years. Mr. Kreager has had a large experience in the plumbing trade.

BUY YOUR BUSINESS A BIRTHDAY-PRESENT.

There must always be men who wipe joints, repair the pipes, and dig the ditches; but from their ranks must come the professional man who will direct operations but leave the hard manual labor to the untrained man. The trade of plumbing is gradually developing into the broader profession of sanitary engineering. There can, perhaps, be no better indication of this tendency than the recent appearance of the cyclopedia of heating, plumbing and sanitation—as far as we know, the most complete work devoted to heating, plumbing, and sanitation, and the allied industries that has been produced in this country. While the work explains thoroughly all the details of standard practice, making it particularly useful to the beginner, it is also an authoritative reference work and seems qualified to meet avery demand of the advanced workman or technically trained expert. To be able to turn to almost any phase of sanitary science as it has been developed to meet modern needs, should be of value to both the busy practical man and the apprentice and beginner as well. The concentrated details concerning this mighty club for the undoing of Giants, Ignorance and Despair, will be seen in the folowing paragraph.

Cyclopedia of Heating, Plumbing and Sanitation. A general reference work on Plumbing, Gas Fitting, Sewers and Drains, Heating and Ventilation, Steam and Hot-Water Fitting, Water Supply, Bacteriology and Sanitation, etc., prepared by a Corps of Sanitary Experts, Consulting Engineers and Specialists of the highest professional standing. Illustrated with over 1,000 engravings. Four volumes; 1,600 pages, 7 x 10 inches. Handsomely bound in red Morocco and cloth; gold stamped. Price $24.00; introductory price, $12.00.

The production of the books arose from the work of the American School of Correspondence in providing instruction for its students, and the books are largely a collection and arrangement of the instruction papers prepared for this purpose. The success which this school has obtained in modern technical education is in itself the best possible garantee for the present work, and, therefore, while this cyclopedia is a marked innovation in the literature of the trade, representing as it does the ideas and methods of a large number of different authors, it is by no means an experiment. Many of the most prominent authorities have been called to their aid by the publishers in the preparation of this work.

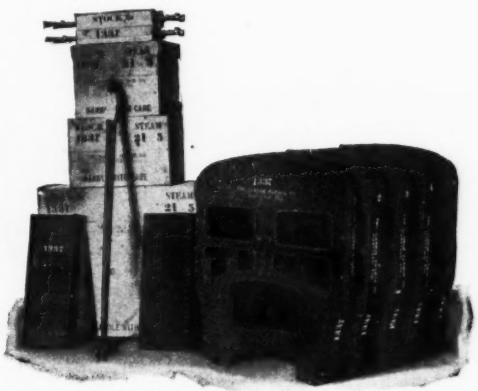
Reference to the work will show that the various subjects are logically and thoroughly treated. For example, Heating and Ventilation is given as thorough handling as though it were in a book by itself. The subject matter all the way through is very practical. Even the material under the heading of "Bacteriology and Sanitation" is not as deep as the title would seem to indicate. The work is fully indexed, free from difficult mathematics, and the subject matter is clearly explained in simple language in connection with a large number of diagrams which appear to have been prepared especially for the text. Two salient features are worthy of comment; one of these is the examples for practice inserted at frequent intervals, and the other is the review questions after each of the various sections, enabling the reader to test his knowledge and make it a permanent possession, the work thus combining the advantages of a textbook and a reference authority. The work as a whole will be a valuable addition to any library, and is a credit to the publishers. It can be obtained from the Book department of "Domestic Engineering," 325 Dearborn St., Chicago, at the special introductory price above noted.

A UNION AS AN ARGUMENT.

The Jefferson Union Co., Lexington, Mass., is advertising a weighty argument in favor of the use of the Jefferson unions and flanges by sending to the trade a unique paperweight. It is a silent salesman, capable of holding down its position with dignity, and when stood on end has an eloquence fully equaling that of the ordinary salesman. The reason is that it shows in section the advantages claimed for the union whose leading qualifications render it "worryless, laborless, and leakless." Now, if you do not want to be "unionless" write to the company, using your privilege as a subscriber to "Domestic Engineering" to get an inside grip on this interesting souvenir.

A Common Bond

There is a common bond of excellence uniting IDEAL Boilers and AMERICAN Radiators. Both have the same good qualities of scientific design, careful workmanship and durability. Although independent heating units, each depends upon the other to accomplish the full measure of economy and superior heating service.



IDEAL Boiler. Packed for Shipment.

A further advantage expressed in this unity is the prompt and timely delivery of the important parts of the heating equipment when an IDEAL Boiler and AMERICAN Radiators are used on the same job. The absence of worry and the saving of time to the heating contractor are items of importance.

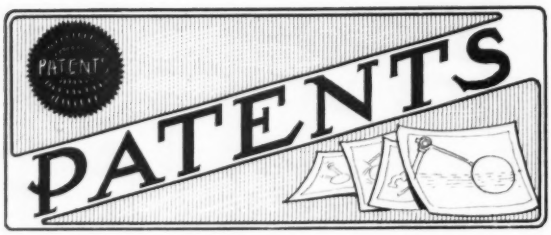
AMERICAN RADIATORS & IDEAL BOILERS

A Heating Outfit is More Efficient with NORWALL and SYLPHON SPECIALTIES

AMERICAN RADIATOR COMPANY

General Offices, 282-286 Michigan Ave., Chicago.

New York	Cincinnati	Cleveland	Atlanta	Bradford, Ont.	Denver
Philadelphia	Boston	Milwaukee	Minneapolis	Seattle	St. Louis
Pittsburg	Buffalo	Indianapolis	Kansas City	Omaha	San Francisco
Washington					



953,787. Shower-bath Mixer. William Ingham, Chicago, Ill. Among the claims made for this invention are the following: "In a shower bath mixer, in combination a mixing chamber having an outlet and a cold water inlet, and a contained coil for superheated water or steam, said coil having at its free end means for comminuting the discharge of its contents within said chamber, substantially as specfied."

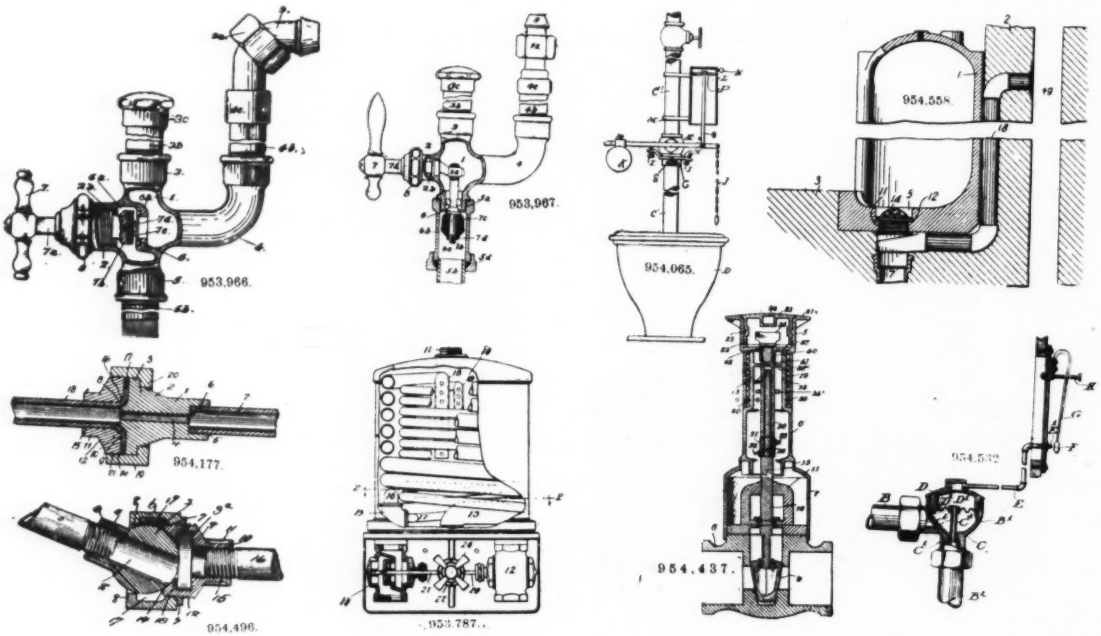
953,966. Compression-Valve Fitting. Philip Mueller, Decatur, Ill., assignor to H. Mueller Manufacturing Company, Decatur, Ill., a corporation of Illinois. One of the claims made for this invention is as follows: "A lavatory fitting comprising a valve-casing having a valve-seat extending across the same, a service supply branch leading to said casing perpendicular to the valve-seat, a valve-housing extending from said casing, valve mechanism mounted therein, an air-chamber branch leading from said valve-casing, and a cock-supply branch leading from said valve casing."

953,967. Fuller-Valve Fitting. Philip Mueller, Decatur, Ill., assignor to H. Mueller Manufacturing Company, Decatur, Ill., a corporation of Illinois. This fitting is described in part as follows: "A lavatory fitting comprising a body-portion, a supply service branch having a valve seat formed thereon integral with said body-portion, a valve controlling said service branch, an integral housing extending from said body-portion at right angles to said supply branch, valve operating mechanism mounted in said housing, an air chamber branch, and a cock-supply branch extending from said body-portion at a right angle to the air chamber branch curving thence to bring the axis of its discharge opening parallel to the axis of said air-chamber branch and the said supply branch.

953,971. Work-Holder for Pipe-Threading Tools. Ira W. Nonnenman, Warren, Ohio, assignor to The Borden Company, Warren, Ohio, a corporation of Ohio. The most noteworthy claim made for this invention is as follows: "A work holder for pipe threading tools comprising a housing having a series of radial guideways, a series of pipe clamping members fitted in such guideways, a plate rotatably mounted on said housing and having interlocking engagements with said members to effect the longitudinal movement thereof by the axial turning of such plate, a screw mounted in said housing and engaging one of said members for moving it inward or outward to effect the axial rotation of such plate and the simultaneous adjustment of the remaining members, and a retaining plate mounted on said housing and having a bearing for said former plate.

954,065. Flushing-Tank Valve. Edward J. Wackerle, Jacksonville, Ill. Filed Nov. 12, 1908. Serial No. 462,323. This invention is described in part as follows: "In a flushing apparatus, a supply pipe, a valve in said pipe, an operating arm connected to the stem of said valve, a collar adjustable longitudinally and circumferentially on said supply pipe, and arms extending from said collar, one of said arms inclined downwardly in order to limit the downward movement of one end of the operating arm, the other arm bent upwardly and then laterally in order to limit the downward movement of the other end of said operating arm and to normally hold said arm in a horizontal position."

954,177. Pipe-Coupling. James A. Fleming, Pittsburg, Pa. The entire claim for this invention follows herewith:



"A pipe coupling comprising the combination with a pipe section 18 having a flared end and a pipe section 7 having a threaded end, of a pair of coupling members and a coupler for connecting said members together one of said coupling members comprising a body-portion having one end thereof enlarged and formed with a peripheral flange, said body having a longitudinal bore terminating at one end in a threaded socket into which extends the threaded end of the pipe section 7, the other end of said bore terminating in an inwardly-extending truncated cone-shaped enlargement projecting from the inner face of said body and having the periphery thereof provided with radially-disposed teeth extending from the inner face of the body to the free terminus of said enlargement, the other of said coupling members comprising a body-portion mounted upon and inwardly of the flared end of the pipe section 18 and having one end thereof enlarged and exteriorly-threaded, the free terminus of said cone-shaped enlargement projecting into the flared end of the pipe section 18 and beyond the plane of the inner face of that coupling member mounted upon the pipe section 18, and said coupler comprising a cylindrical body-portion having one end thereof formed with an in-

wardly-extending annular flange adapted to engage said peripheral flange and said cylindrical body-portion further having interior threads adapted to engage the screw-threads of that coupling member mounted upon the pipe section 18 whereby said coupling members are connected together and the flared end of the pipe section 18 clamped between the opposing faces of the coupling members."

954,235. Soldering-Iron Furnace. Samuel T. Willson, Denver, Colo.

954,433. Water-Motor. John H. Hendrickson, Cleveland, Ohio.

954,437. Extension Service-Box. Francis M. Jacob, Columbus, Miss. This invention is described in part as follows: "The combination with a valve and housing, of a service box including upper and lower sections one of which is arranged to bear against the valve housing and is provided with oppositely disposed recesses having cam lugs extending therefrom, the upper casting section being provided with a depression, and having oppositely disposed hollow ribs, an intermediate casing section having its upper end provided with racks fitting the hollow ribs, and its lower end formed with ears adapted to extend through the recesses in the lower casing section for engagement with the cam faces of the lugs, an extension rod comprising telescopic members, one of which is provided with means for engaging with the valve stem and the other with a head seated in the depression of the upper casing section, and fastening devices extending through the ribs of the upper casing section and engaging the teeth of the rack."

954,496. Flexible Pipe-Joint. George F. Barron, Palmyra, N. Y. The most noteworthy claim made for this invention reads as follows: "In a metallic flexible pipe-joint, a ball member solid but for an axial bore and having an interiorly threaded extension, an annular member having an integral inturned flange with its inner wall in a line at right angles to its axis and upon which said ball has a bearing, and a member having unlimited threaded engagement with said annular member and having at one end an interiorly threaded extension and at the other end an inturned flange with concave bearing surface within said annular member for co-operation with the ball, the bearings of the ball upon said concave surface and right-lined wall of said flange being out of axial alignment with each other, whereby the bearings are widely separated and an annular chamber formed therebetween."

954,504. Pipe-Coupling. Warren F. Drew, New York, N. Y.

954,542. Heating System. Harry C. Mallory, New York, N. Y. One of the claims made for this invention reads as follows: "In a heating system comprising a radiator connected to a steam supply and to a low pressure outlet pipe, the combination with said low pressure pipe of a valve controlling its connection to the radiator, a fluid pressure motor operatively connected to said valve and independent of the accumulation of water of condensation in said radiator, a restricted passage directly and permanently connecting the low pressure pipe to the motor chamber irrespective of the position of the valve, an air port also connected to the motor chamber and a thermostatically controlled valve operating in connection with said air port to open and close the same."

954,533. Valve-Handle. Walter P. Marble, Cambridge, Mass.

954,549. Pipe-Coupling. William A. Turner, Providence, R. I., assignor of one-half to Joseph C. Hartwell, Providence, R. I.

954,558. Venilating-Fitting for Urinals, etc. James M. Young, Pittsburg, Pa., assignor to Fort Pitt Supply Company, Pittsburg, Pa., a corporation of Pennsylvania. The leading claim for this invention reads as follows: "A flushing and ventilating fitting comprising a tubular member having its upper end arranged for a detachable connection to the outlet of the fixture to be flushed and provided with an internal circumferential enlargement connecting laterally with the passage through said tubular member entirely around the same and leading to a side ventilating outlet-connection integral with said tubular member."

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NEW YORK	-	129 Worth St.	ST. LOUIS, MO.,	-	L. M. Rumsey Mfg. Co.
CHICAGO	-	34 Dearborn St.	DENVER, COLO.,	-	Kellogg & Stokes Stove Co.
OMAHA		916 Farnam St.	DULUTH, MINN.,	-	Duluth Plumbing Supplies Co.

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